

# THE IRON AGE

A Review of the Hardware, Iron, Machinery and Metal Trades.

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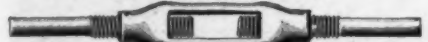
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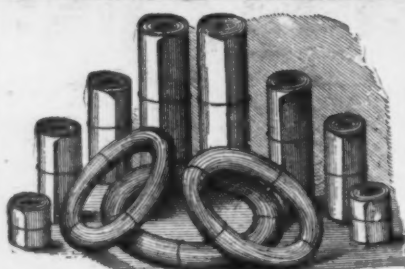
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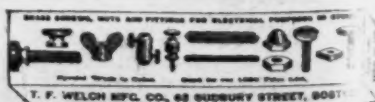
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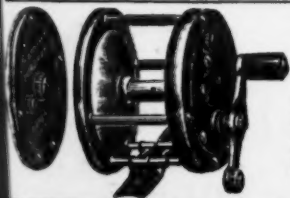
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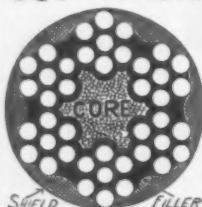
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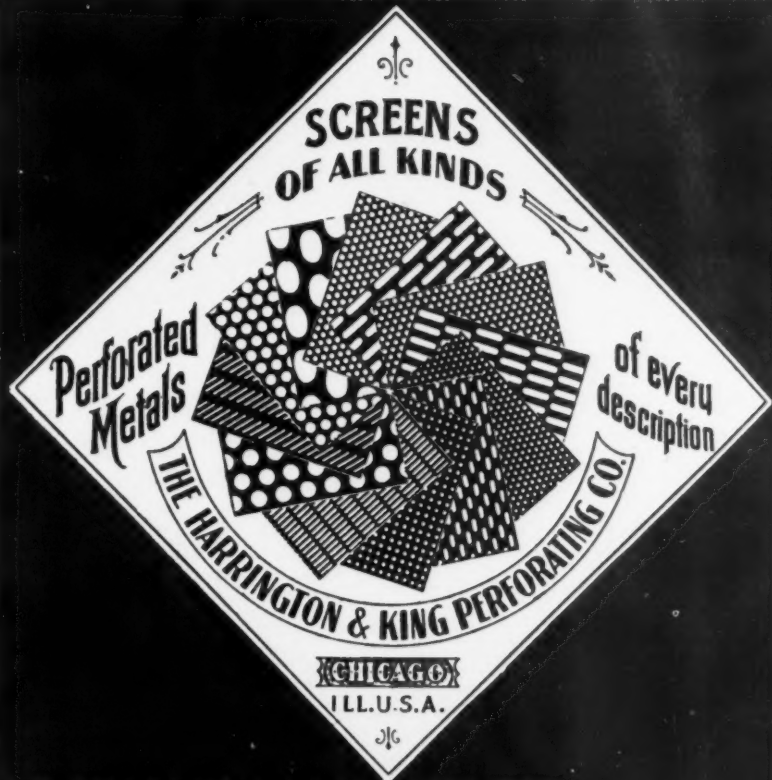
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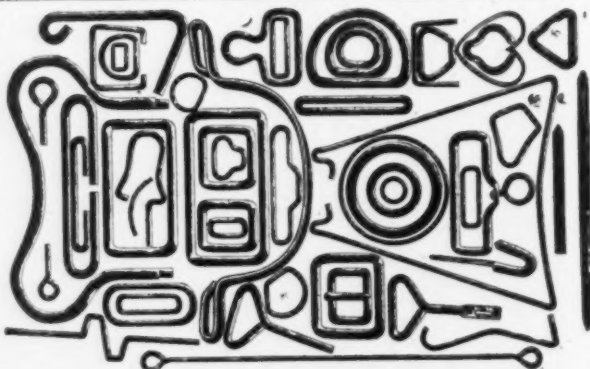
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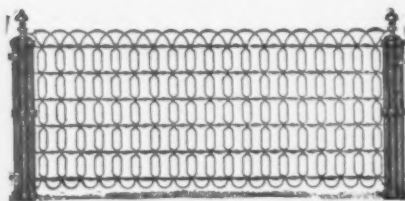
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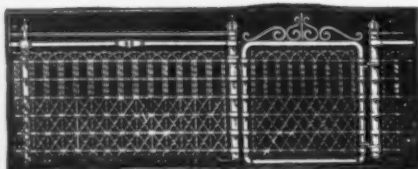
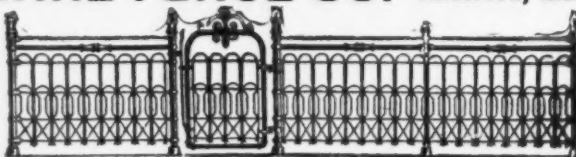
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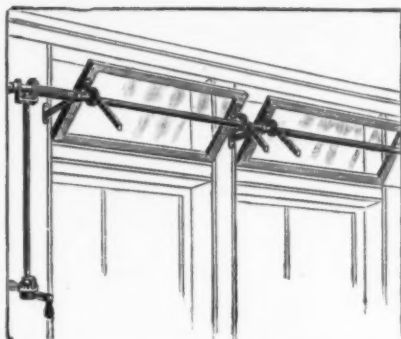
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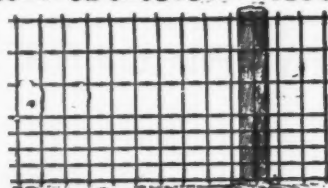
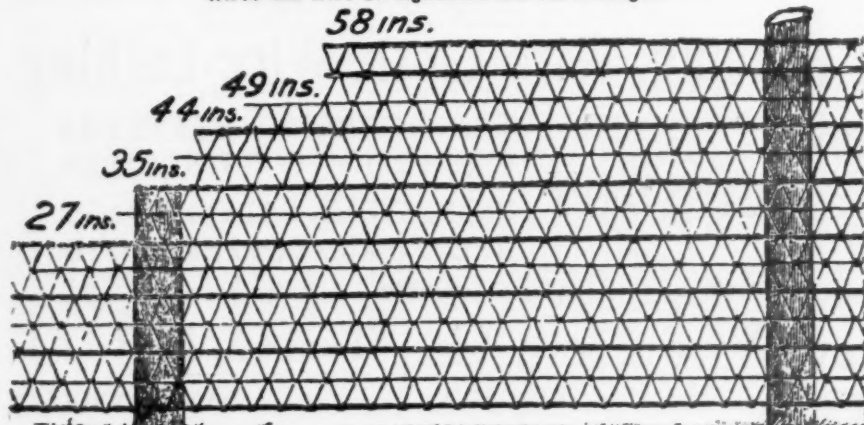
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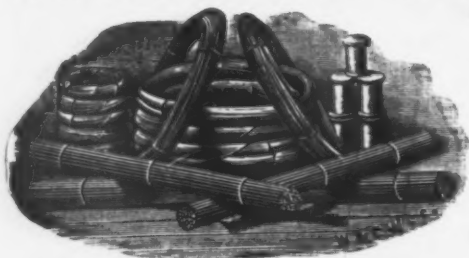
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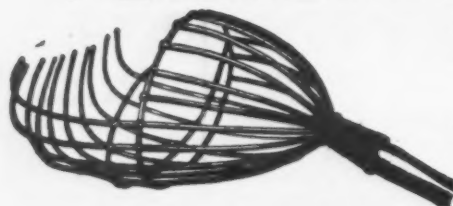
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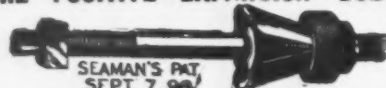
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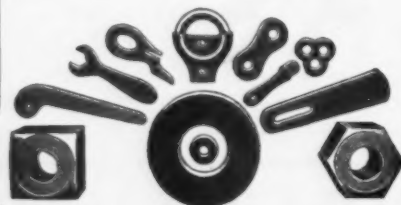


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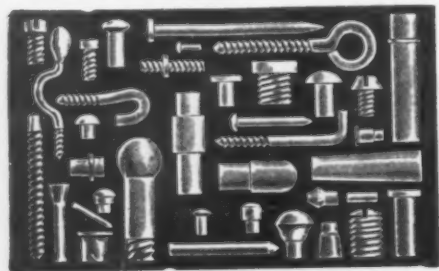
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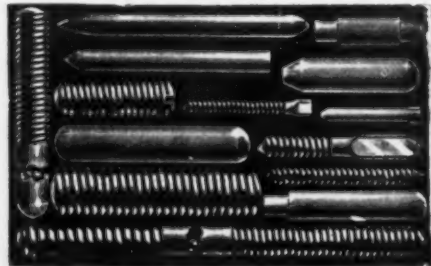
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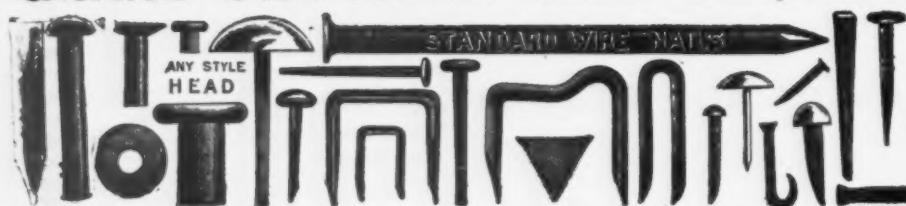
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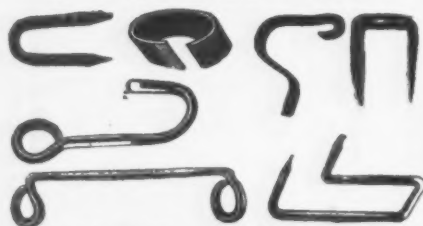
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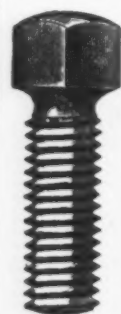
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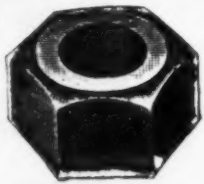
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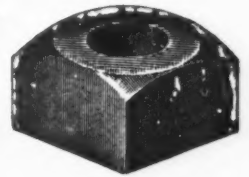
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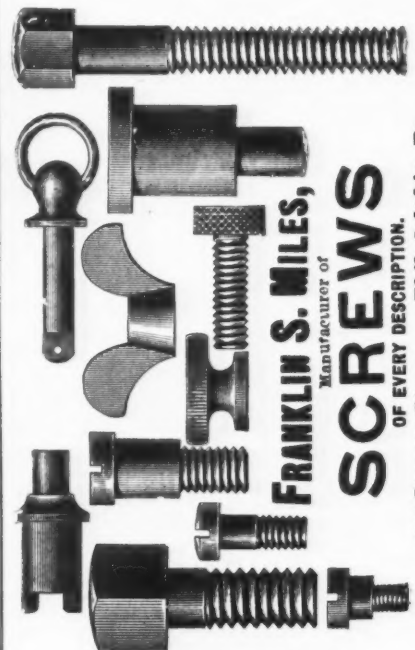


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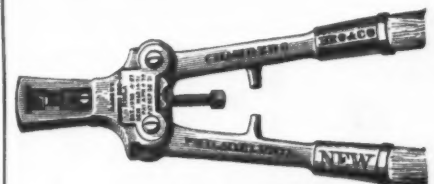


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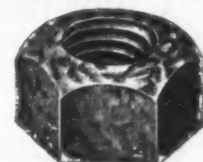


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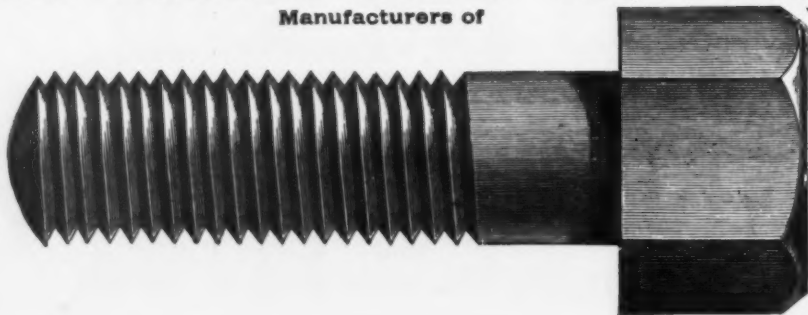
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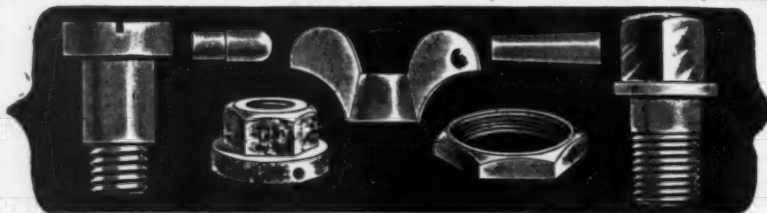
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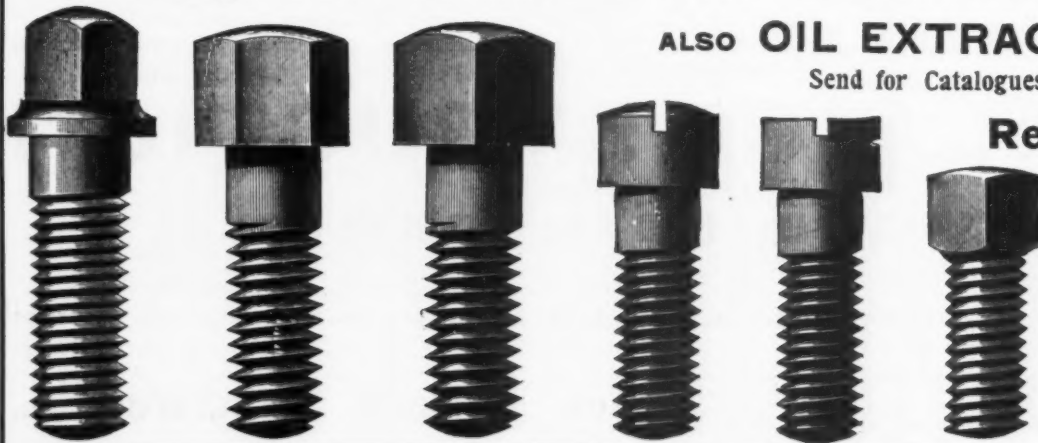
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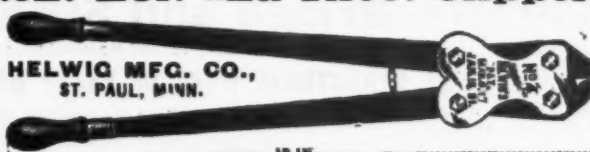
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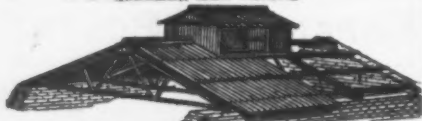
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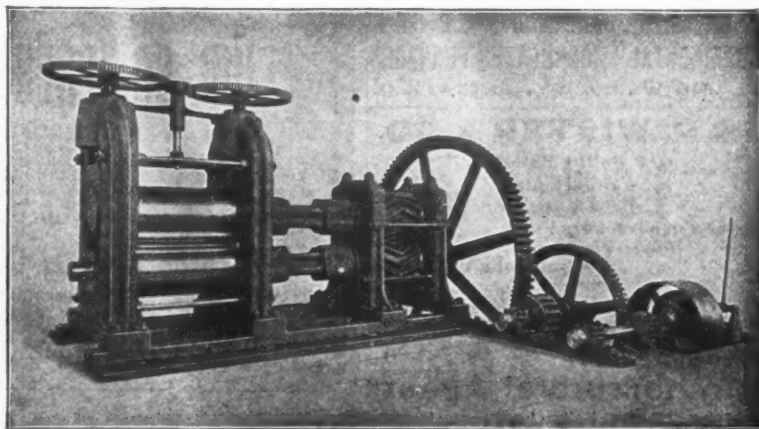
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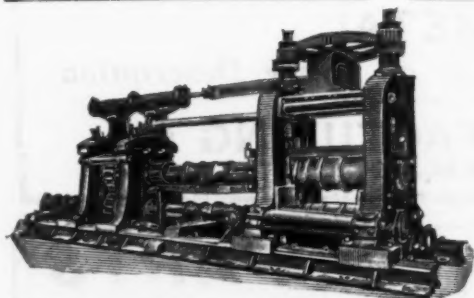
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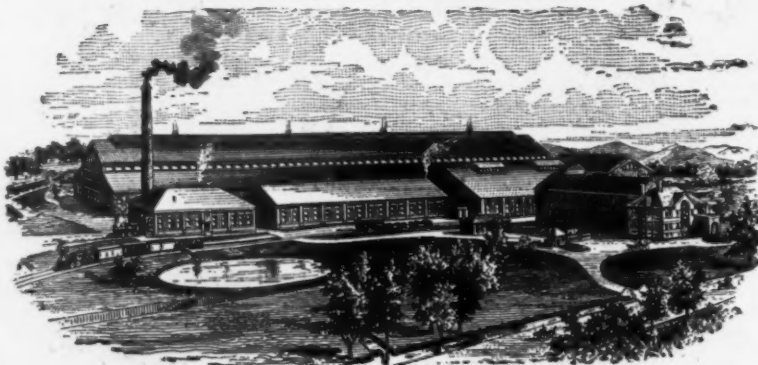
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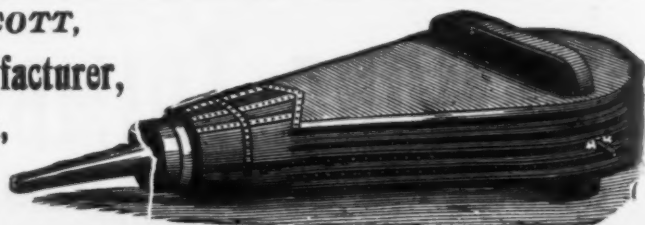
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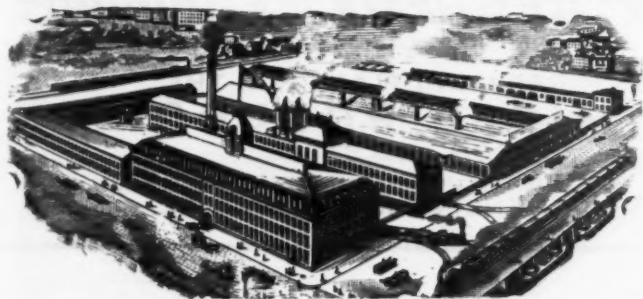
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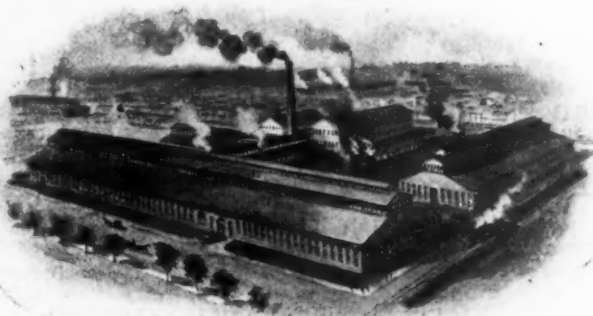
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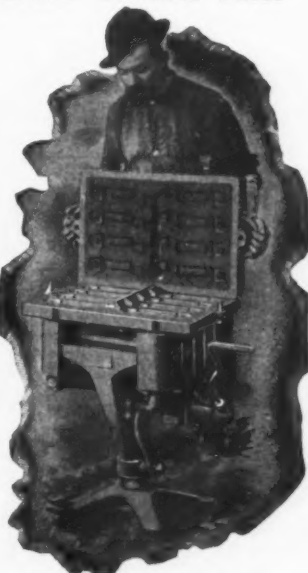
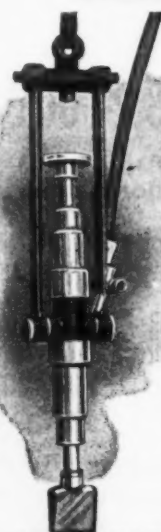
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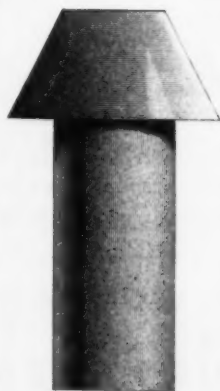
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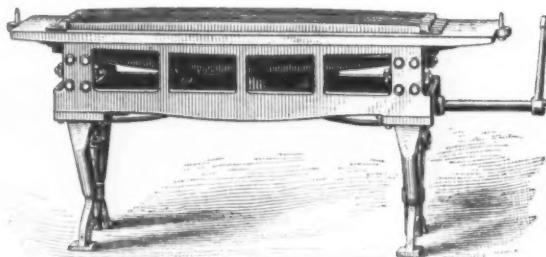
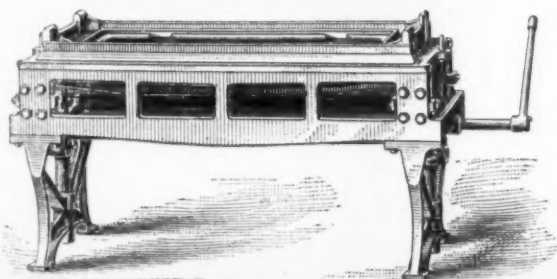
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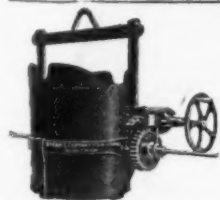
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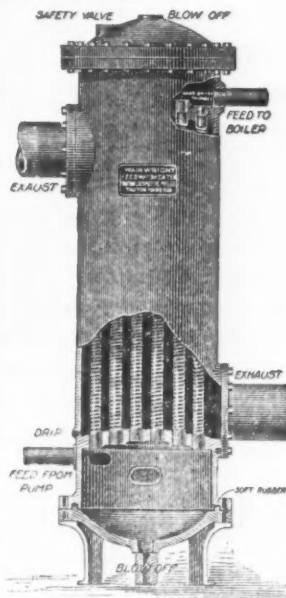


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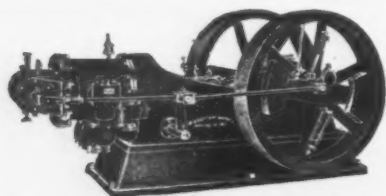


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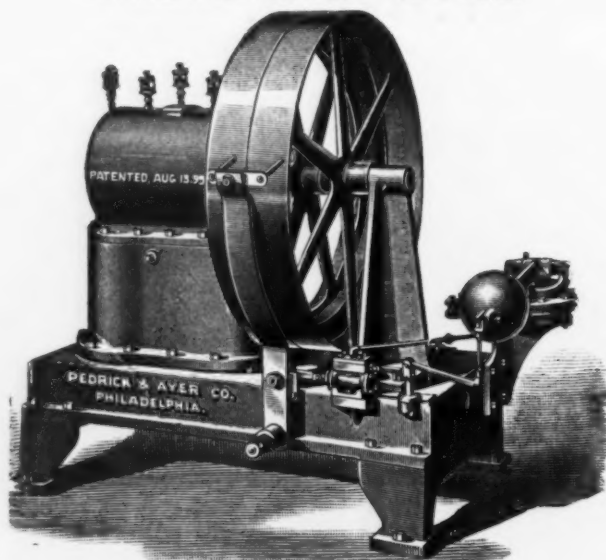
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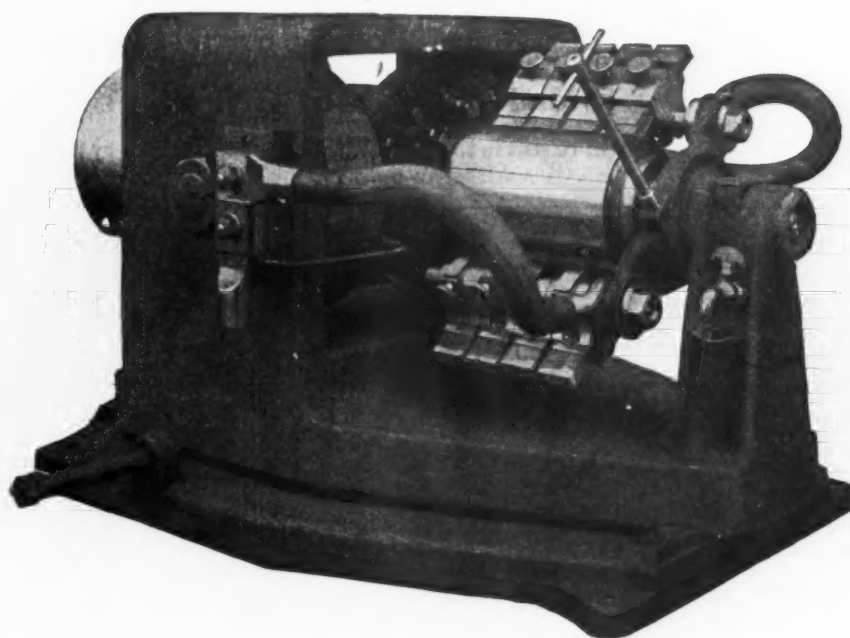
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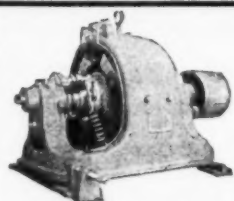
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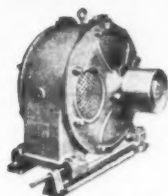
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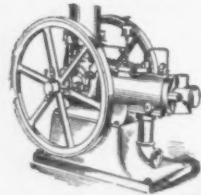
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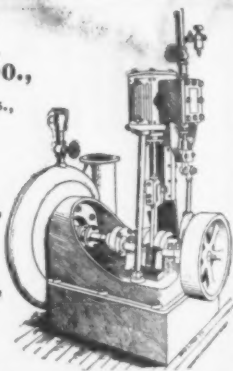
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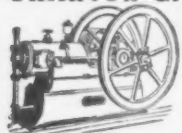
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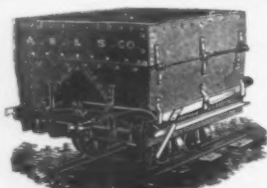
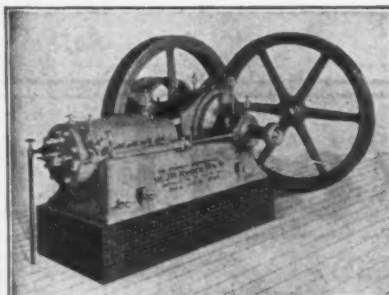
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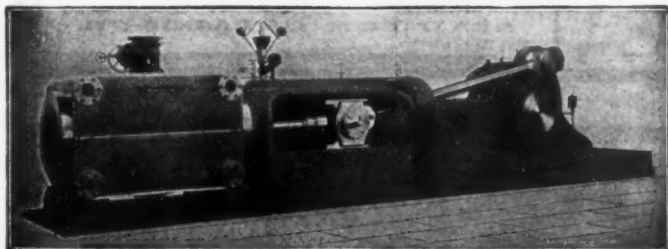
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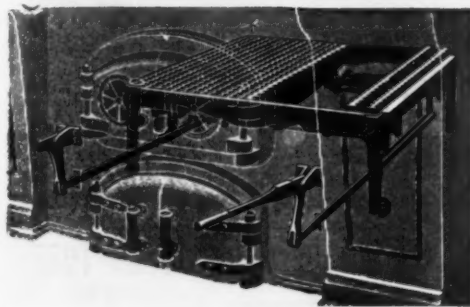
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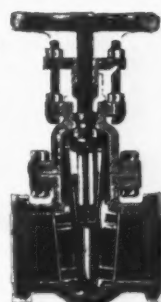
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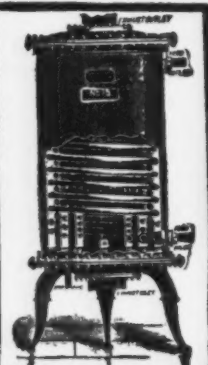
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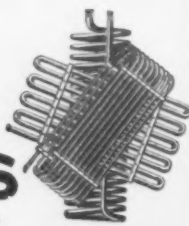
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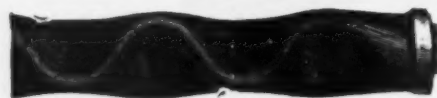
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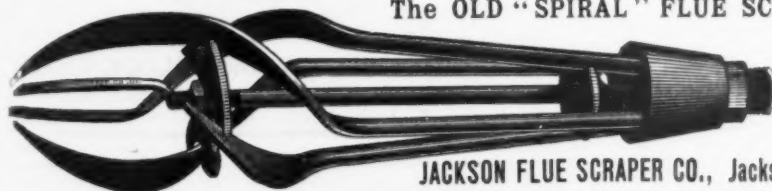
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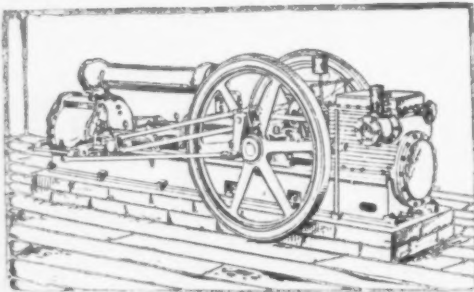
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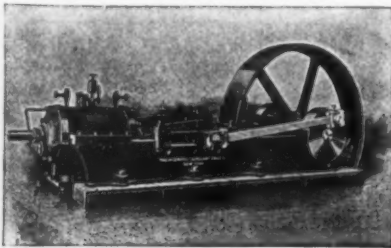


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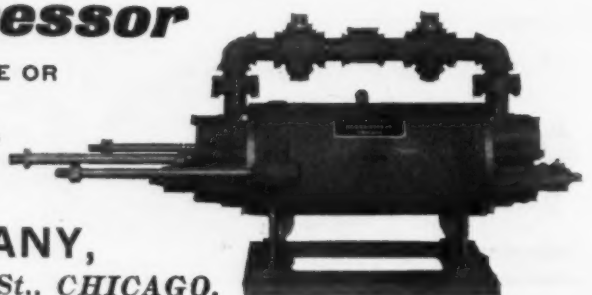
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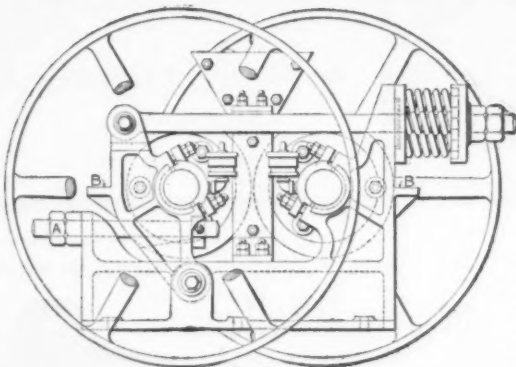


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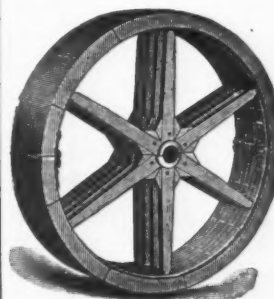
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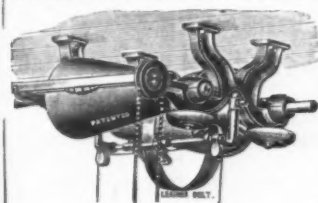
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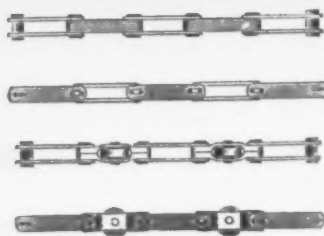


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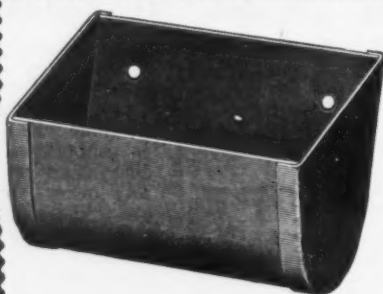
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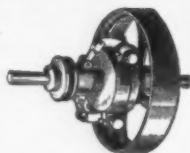
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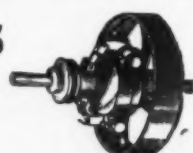
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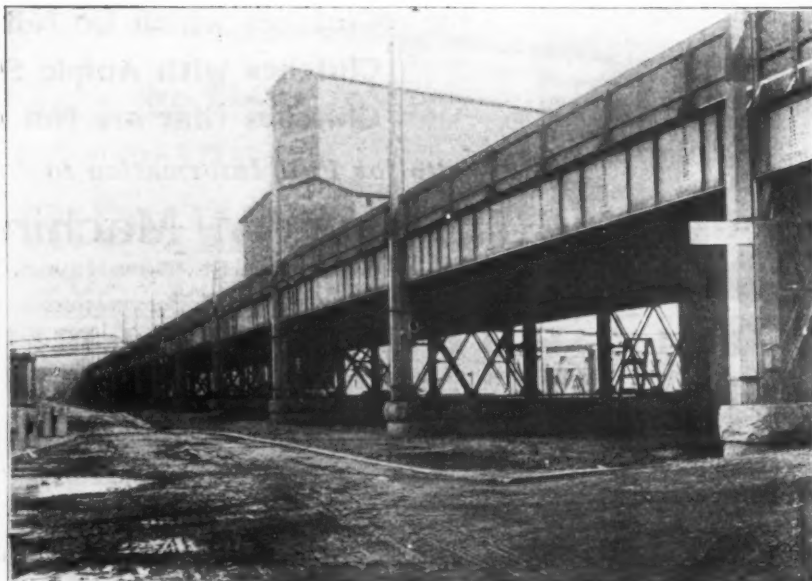
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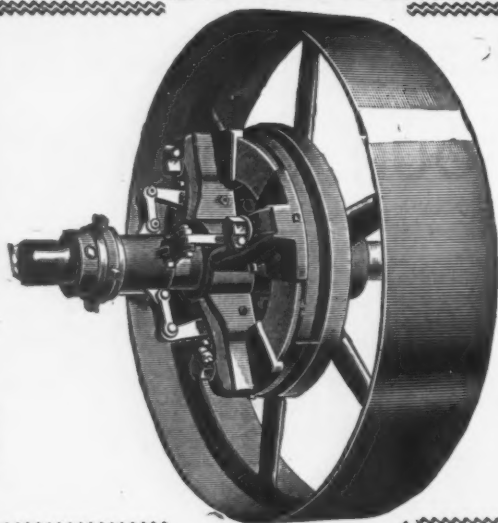
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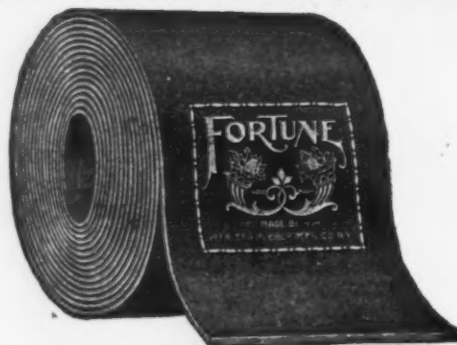
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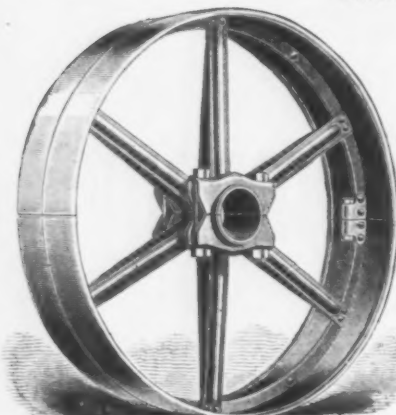
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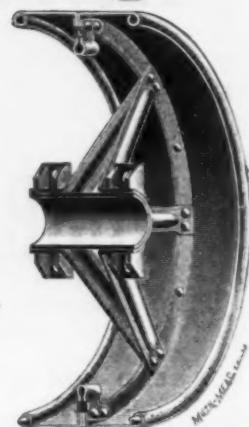
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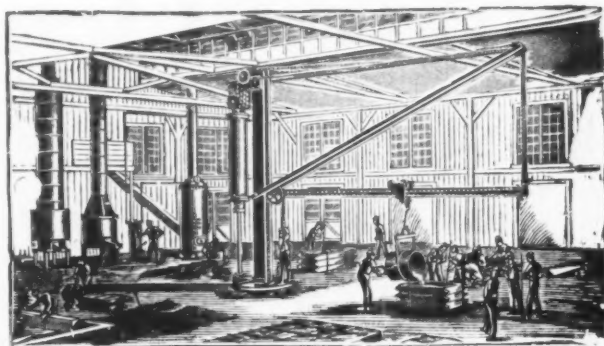
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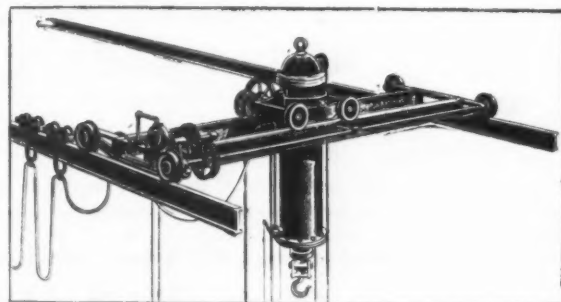


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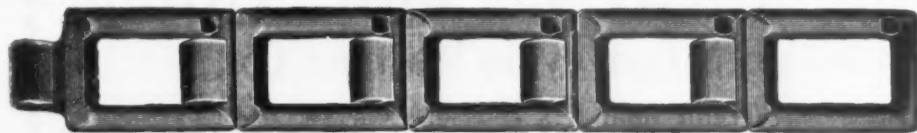


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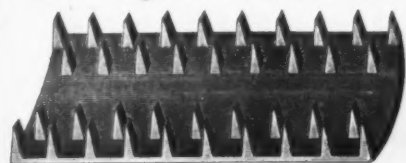
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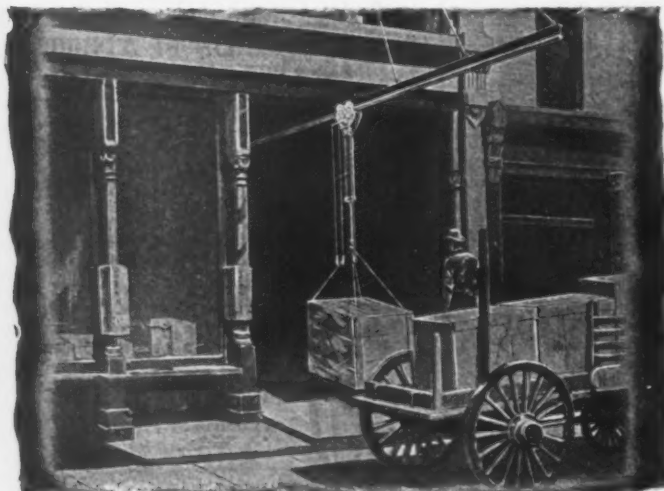
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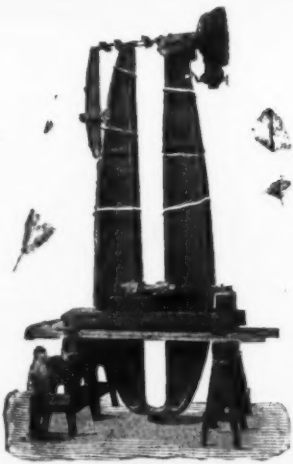
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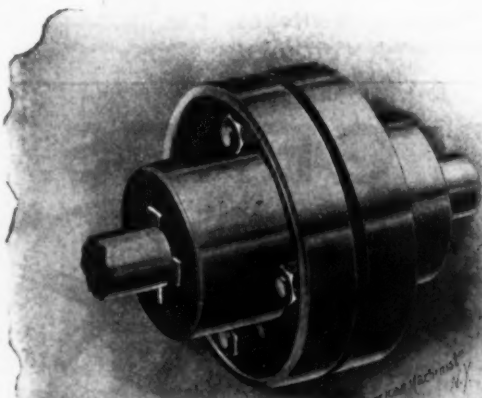


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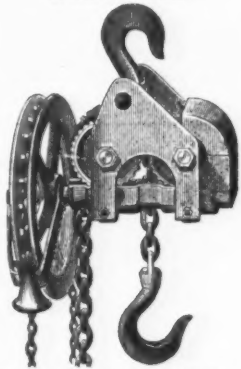
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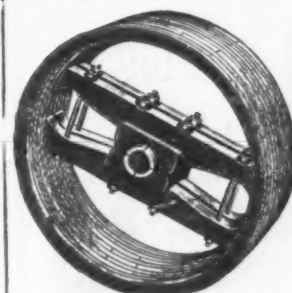
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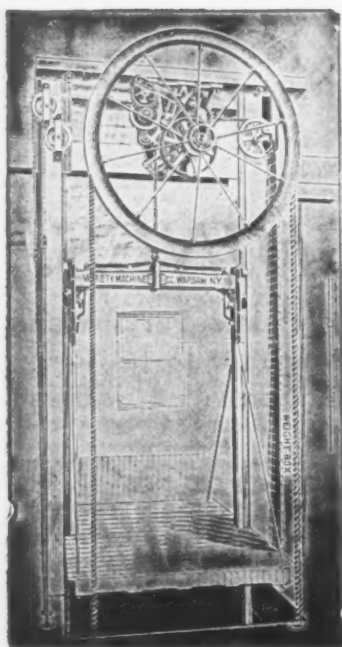
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Lightest and Most Substantial Made.

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You never hear of an accident on

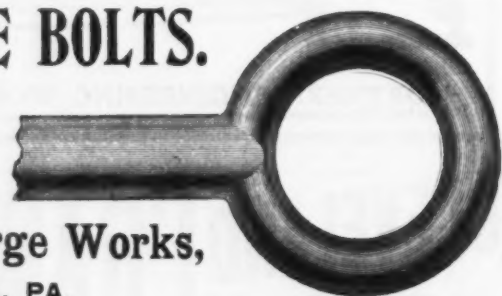
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DROP FORGED FROM STEEL  
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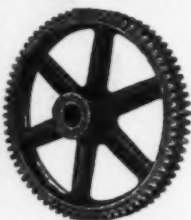
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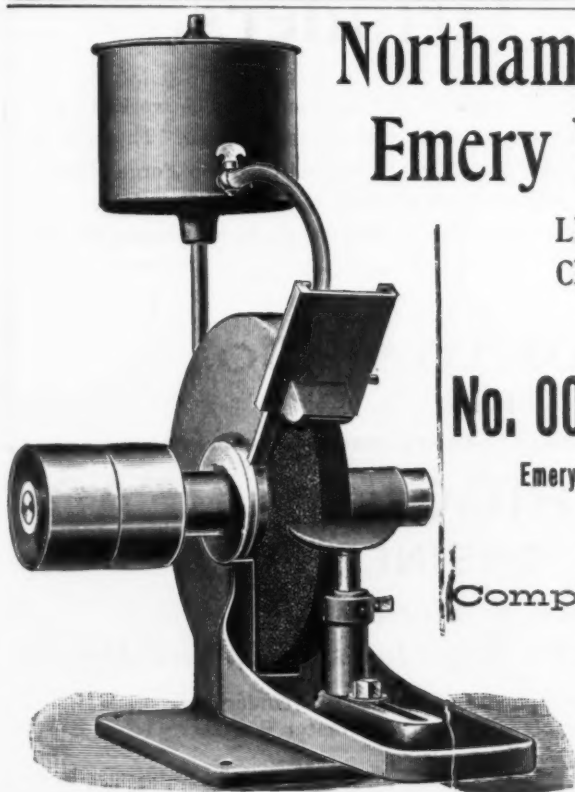
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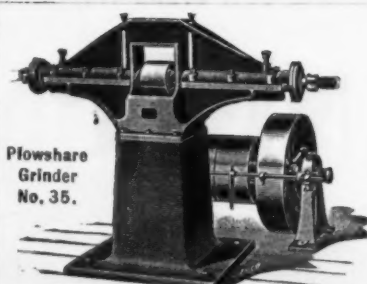
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Emery Wheel, 10½ in. x 1 in.

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for...  
DURABILITY  
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Balance Wheel 10 x ½ in.;

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Height of machine, when set up, 4 feet.

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TOOL GRINDER

Sent on ten days' trial to any responsible party.

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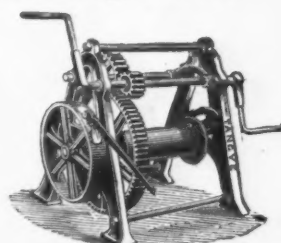
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are made by experienced men, in a modern factory, with up-to-date equipment. They are uniform in quality and rapid cutters. You take no chances in ordering American Wheels. We make only the best, irrespective of price. Our catalogue tells about them. Send for it.



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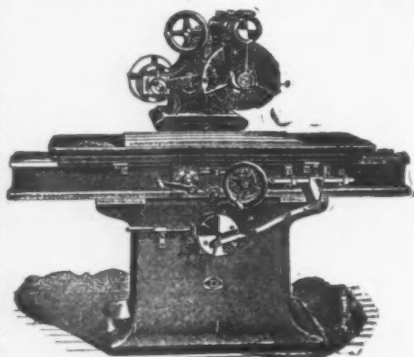
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it is unwise to load your gun with bird shot. Bird shot is all right, but it is not suited to the work at hand.



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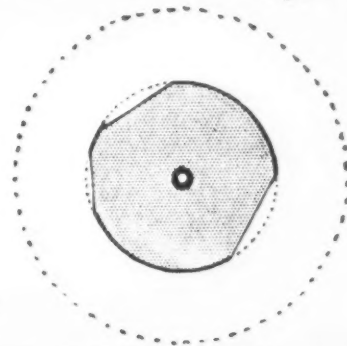
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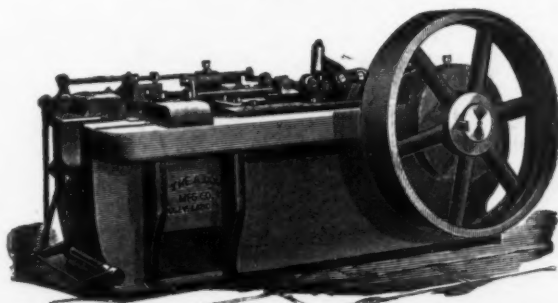
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Bolt Headers,  
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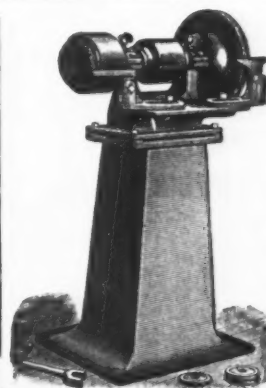
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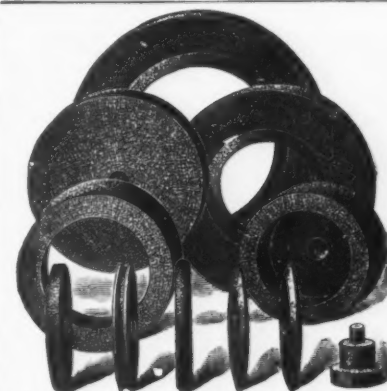
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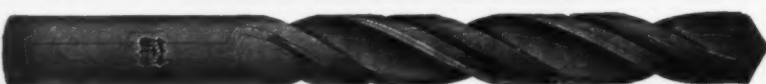
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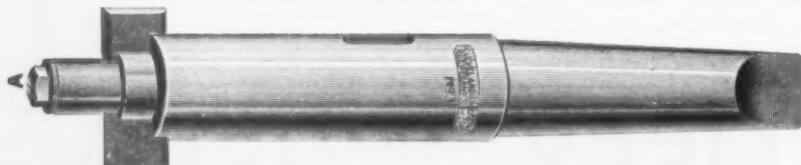


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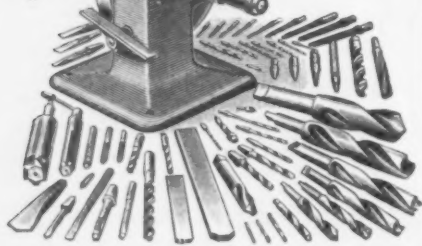
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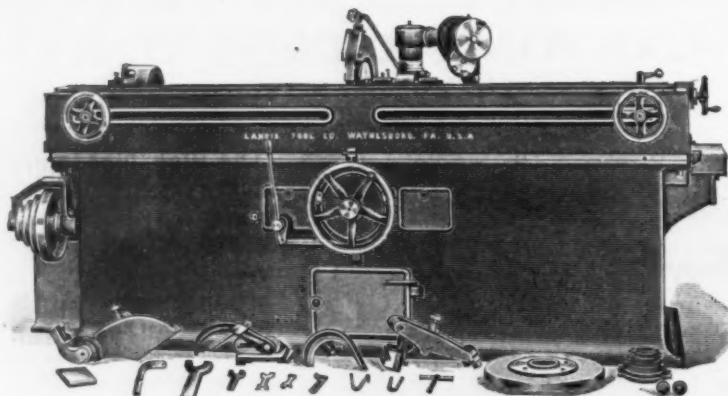
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Our Plain Machine will grind taper as well as straight shafts with automatic traverse, the same as in the Universal.

We make 6 Sizes of Universal Grinders.

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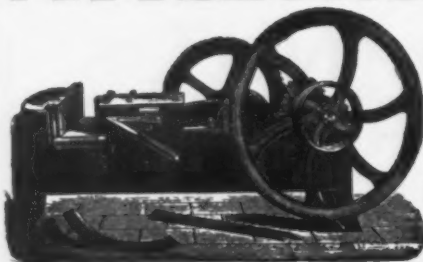
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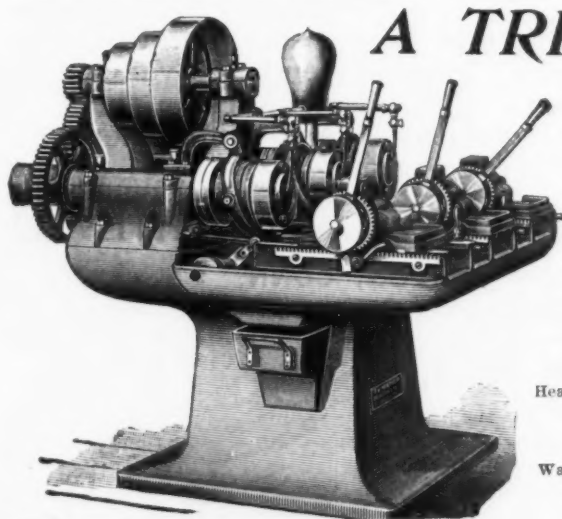


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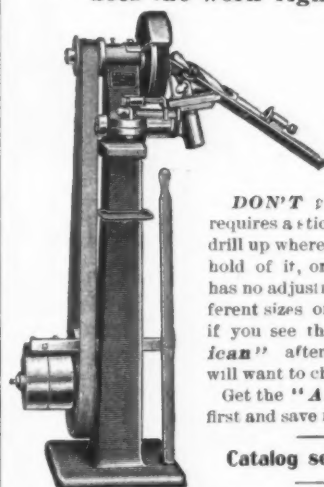
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get a good one and one that  
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**DON'T** get one that requires a stick to get the drill up where you can get hold of it, or one which has no adjustment for different sizes of Drills, for if you see the "**American**" afterwards you will want to change.

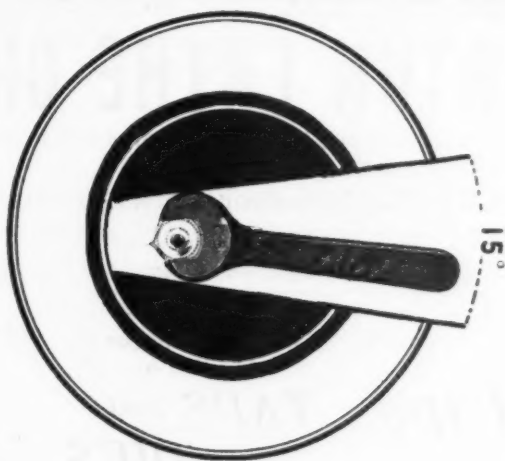
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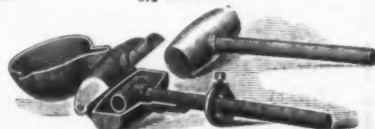
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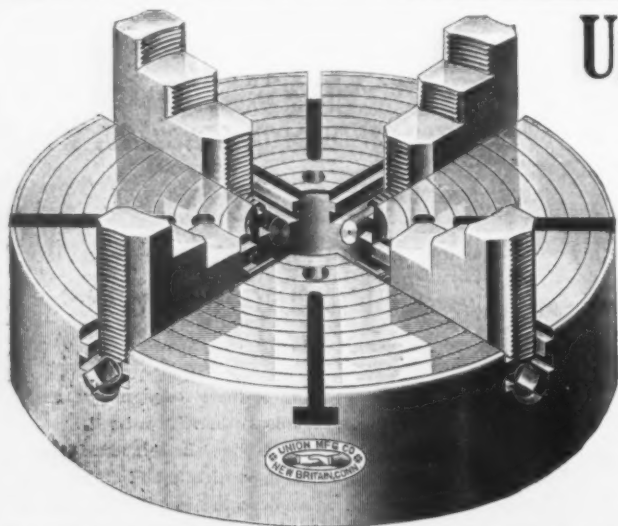
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A well made chuck of great strength, "T" slot commencing with 10 in. size and up.

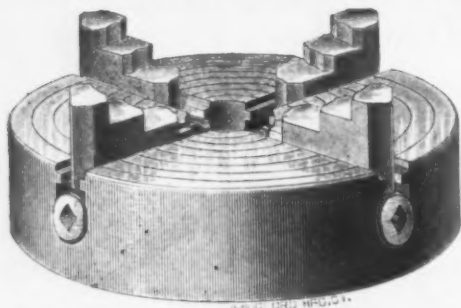
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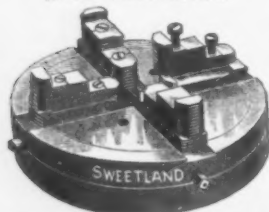
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with patent reversible jaws, is the best all around chuck made. We also make the *Sweetland Geared Scroll Chuck*, the only one with Solid Reversible Jaws. Will furnish the regular one or two sets of jaws if required.

A full line of Combination, Independent, Universal and Scroll Chucks, Face Plate Jaws, etc.

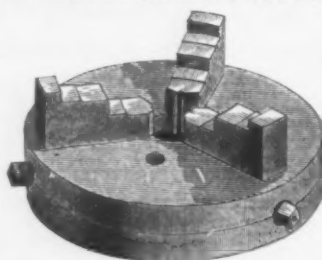


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PAT. JULY 18, 1899.

This is the most economical tool made. Three tools in one—Diamond File, Cutting-off and Threading—all self hardening.

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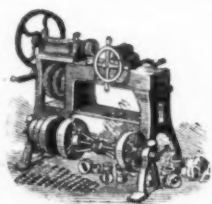
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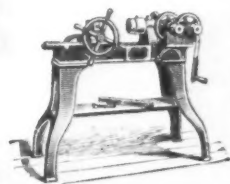


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IN GREAT VARIETY.

HAND and POWER.

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Pipe Cutting  
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Machine.  
Range  $\frac{1}{4}$ -2 in.  
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MANUFACTURERS OF

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Cutting and  
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RATCHET DRILLS, RATCHET DIE STOCKS, MALLEABLE IRON PIPE VISES.

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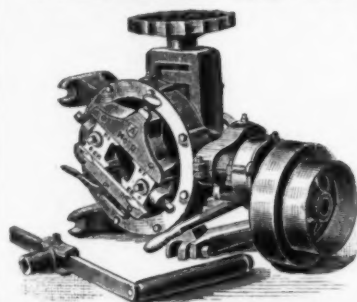
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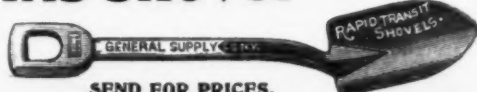
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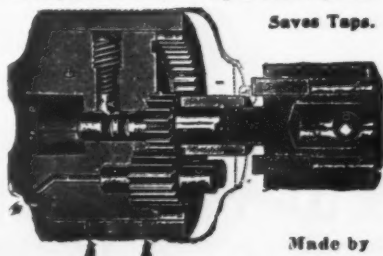


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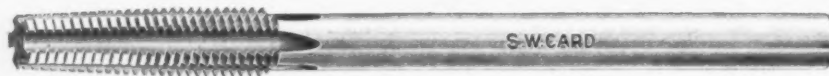


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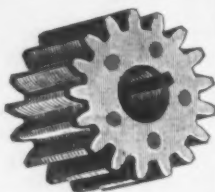
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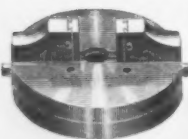
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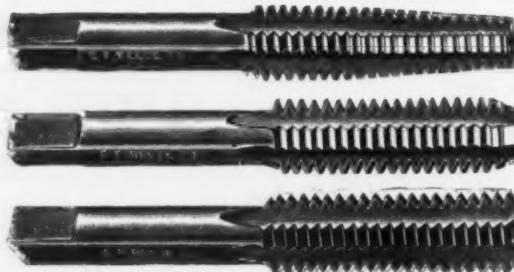
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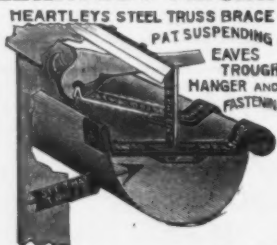
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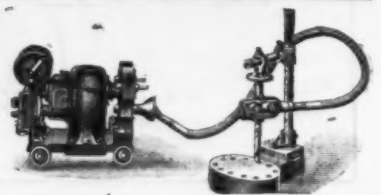
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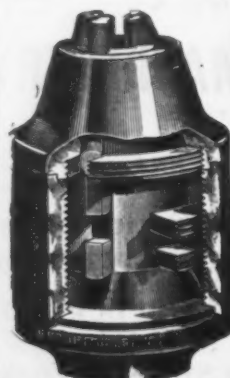
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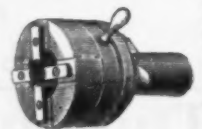
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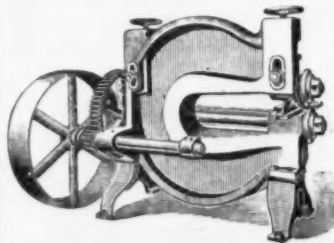
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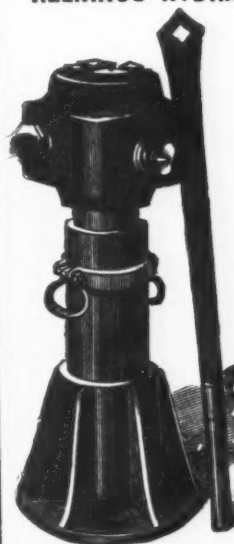
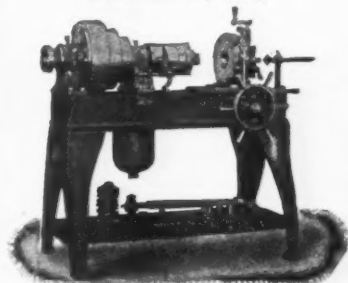
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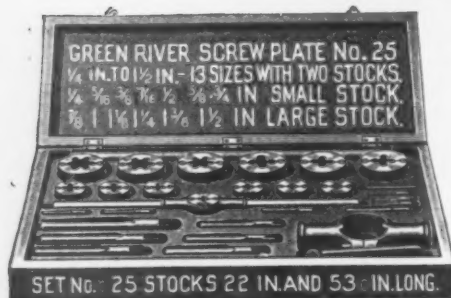
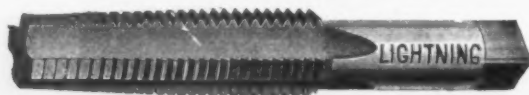
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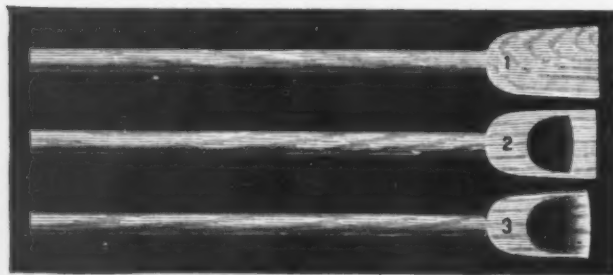


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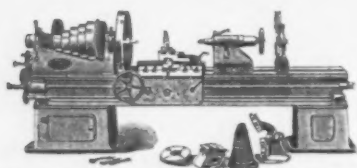
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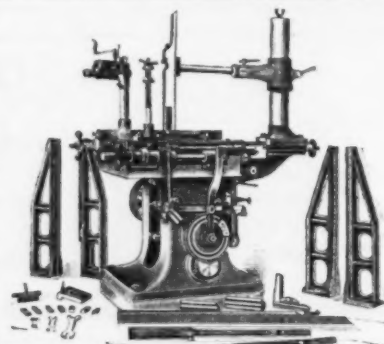
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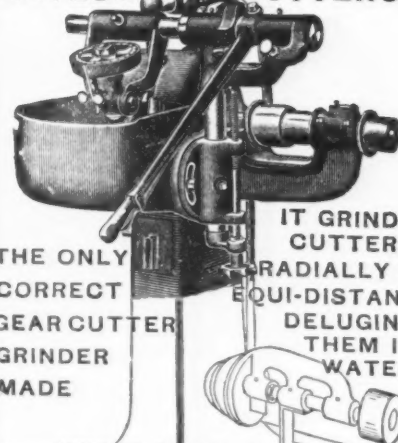
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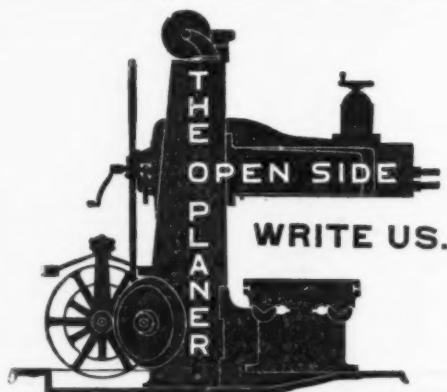
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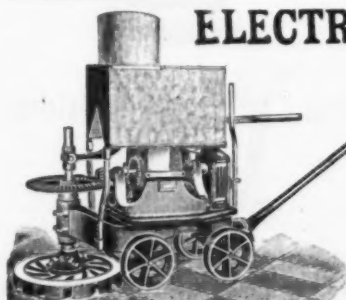
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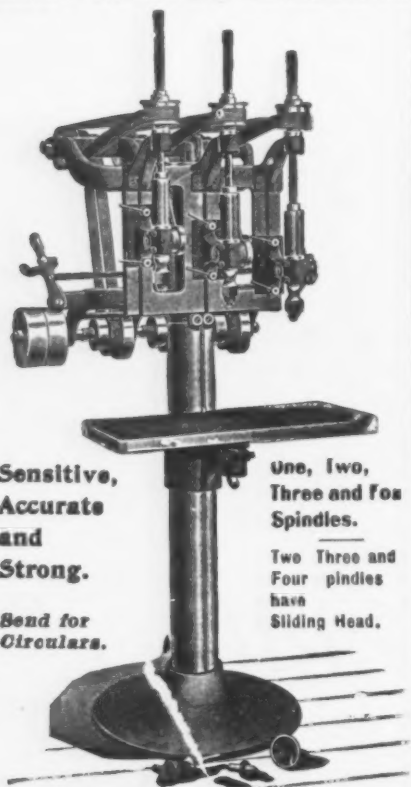
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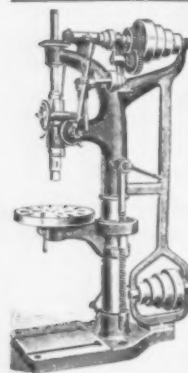
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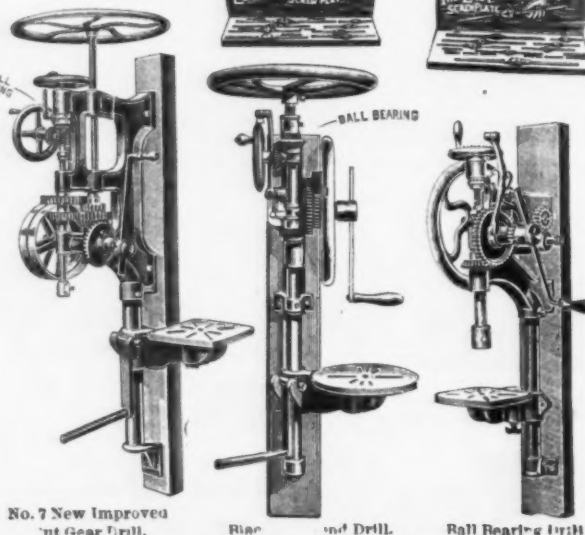
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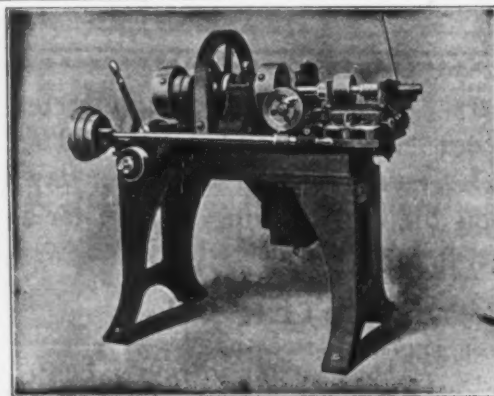
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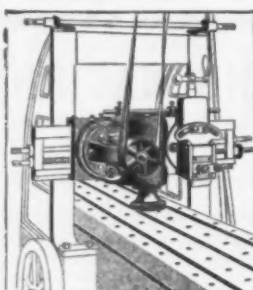
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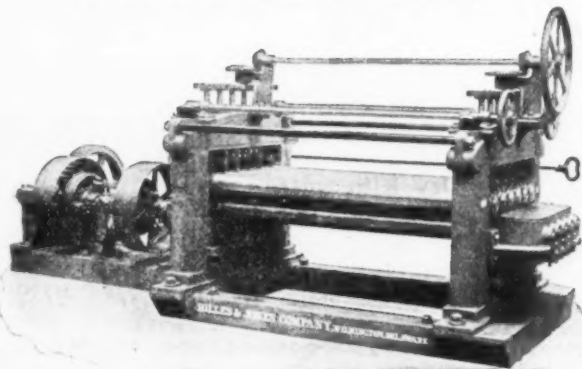


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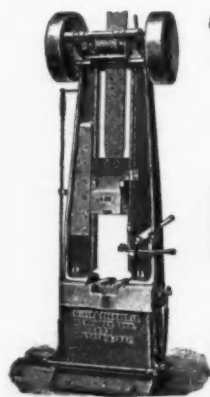
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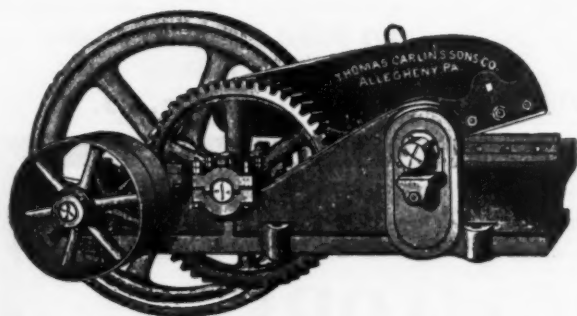
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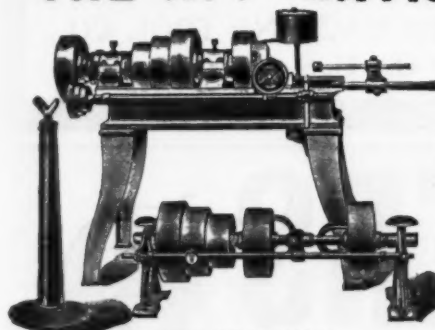
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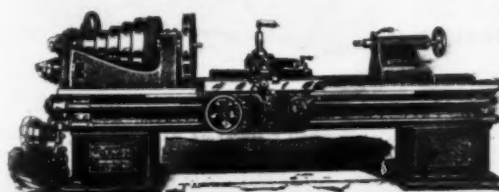
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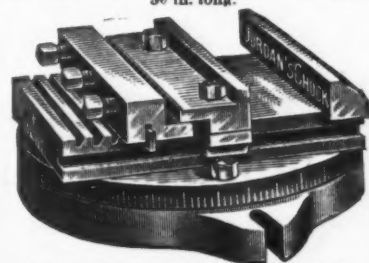
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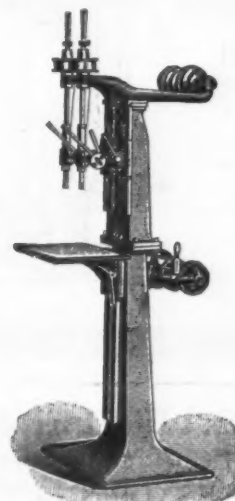
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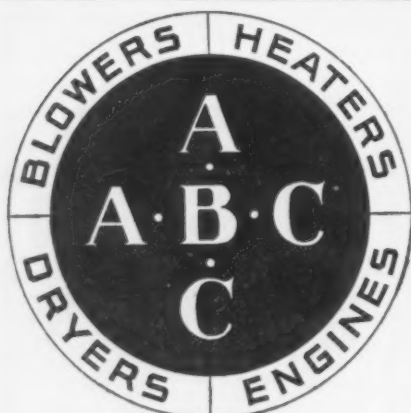


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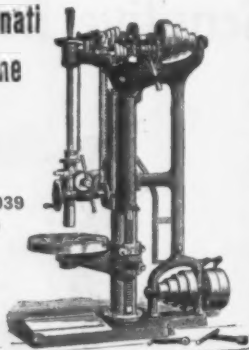
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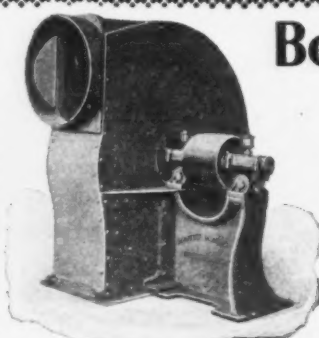
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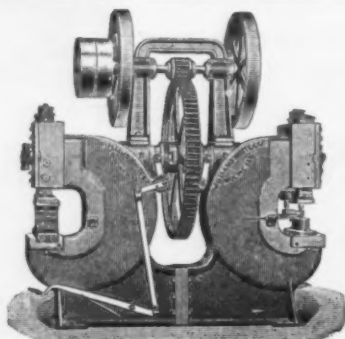


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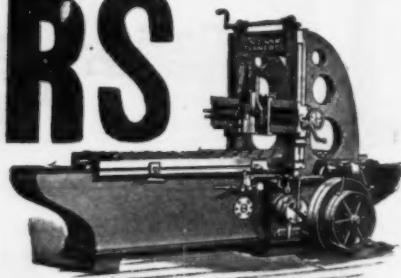
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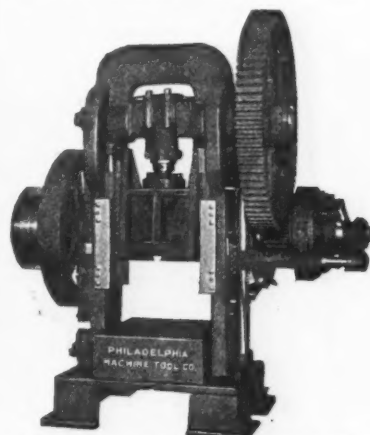
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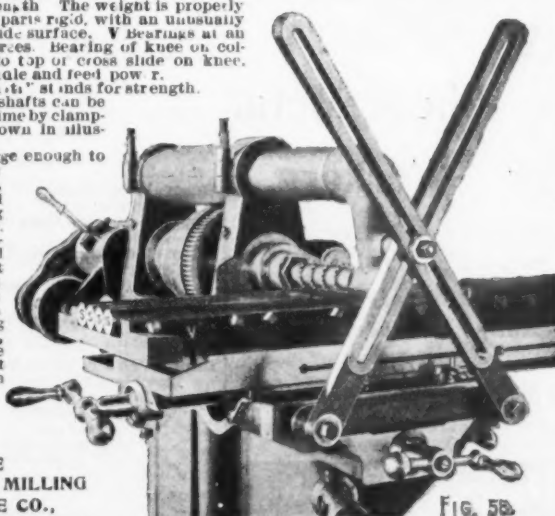


FIG. 5B.

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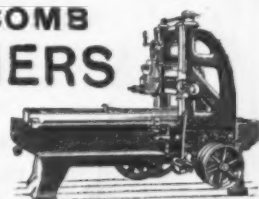
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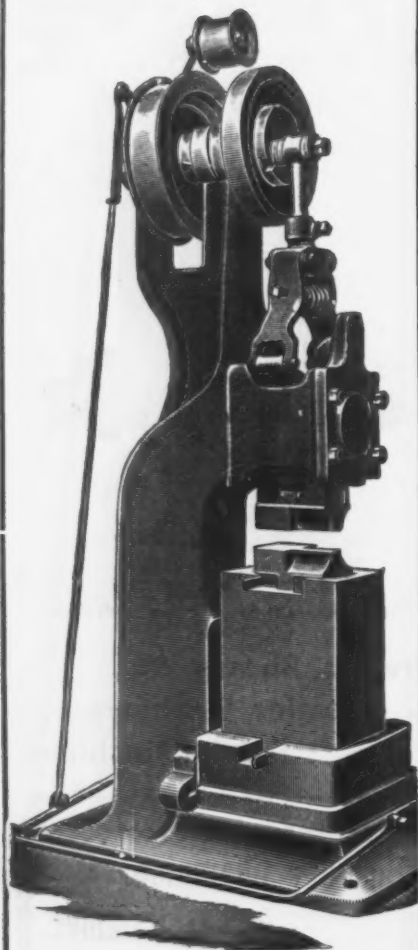
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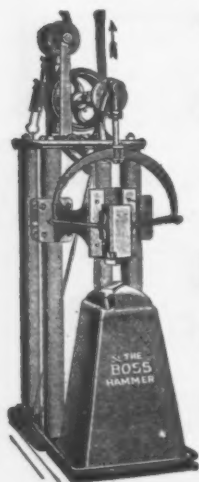
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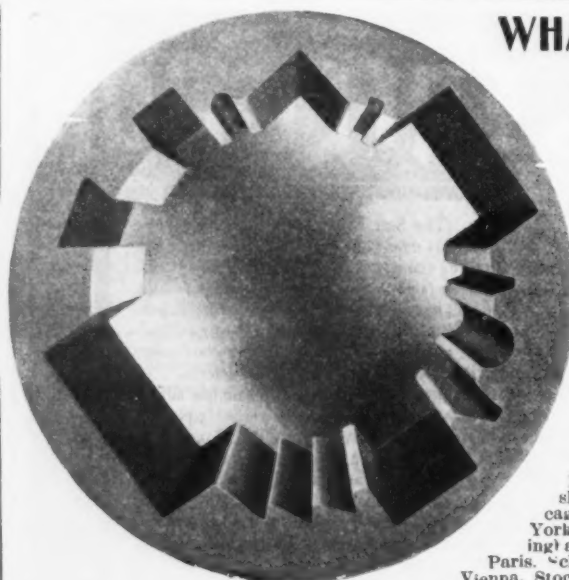
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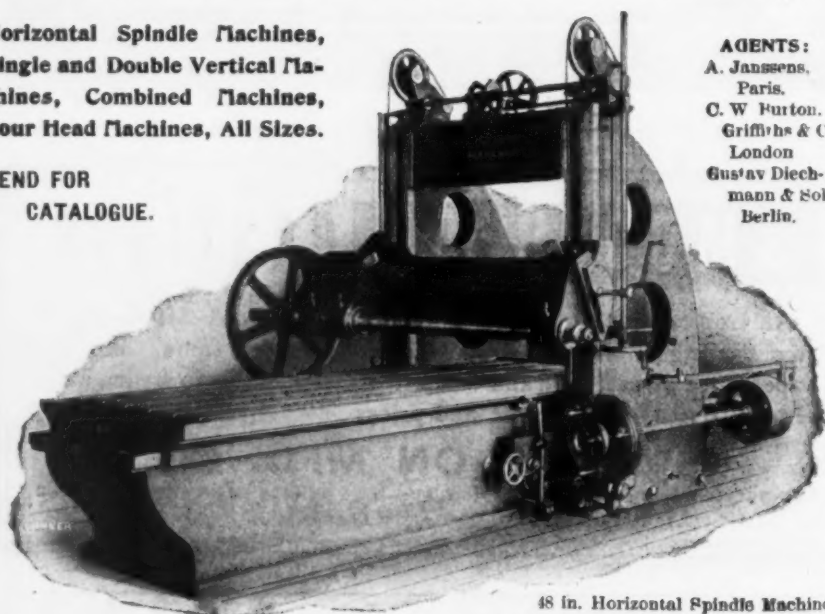
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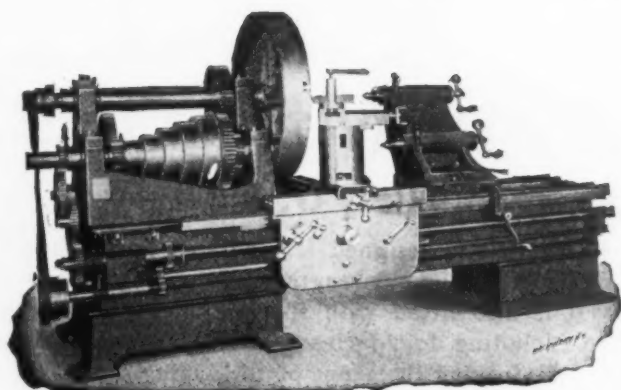
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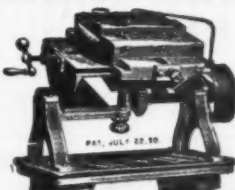
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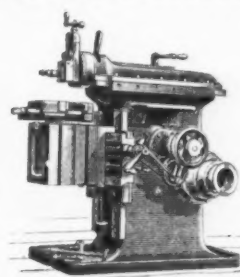


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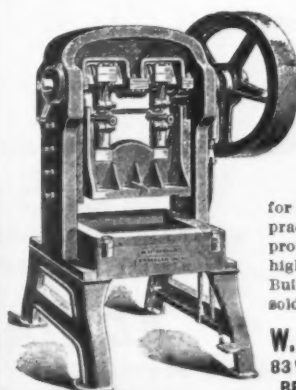


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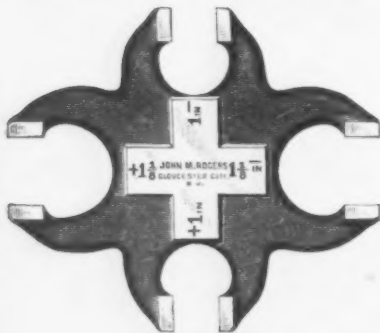


FIG. 14.

For testing bar iron on  
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and annoyances coming  
from off-sized iron.



FIG. 13.

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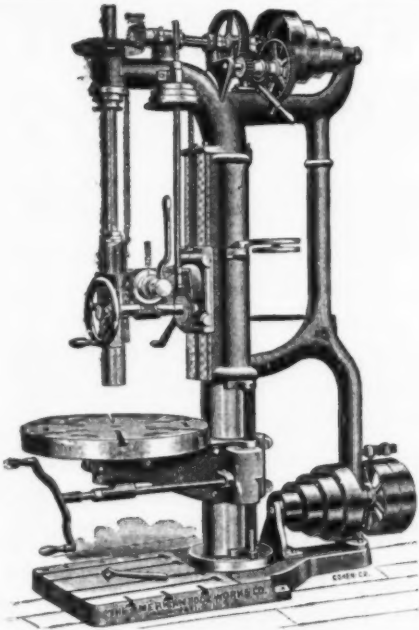
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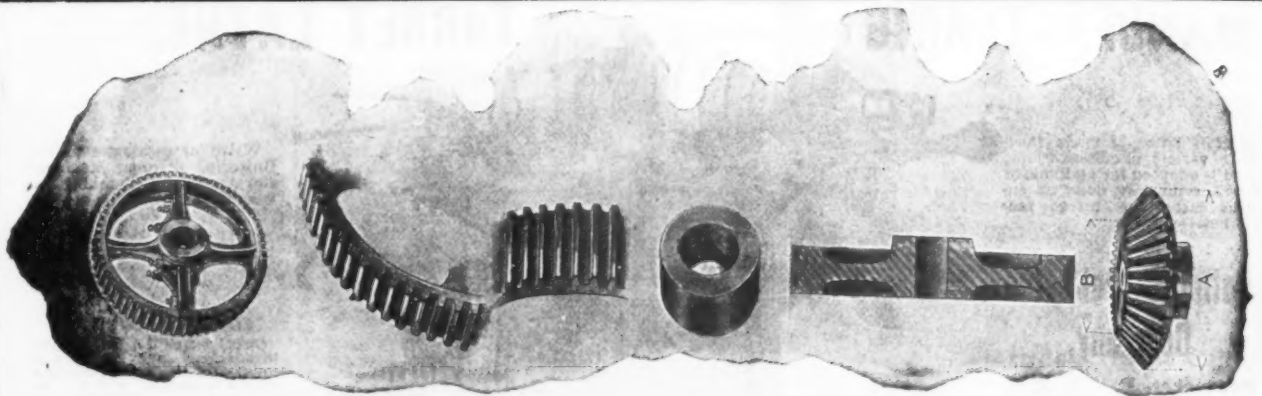


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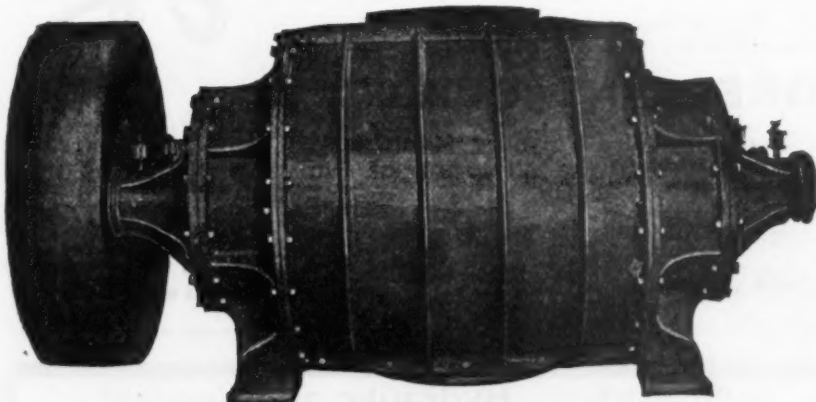
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 2518 Frankford Ave., Philadelphia, U. S. A.

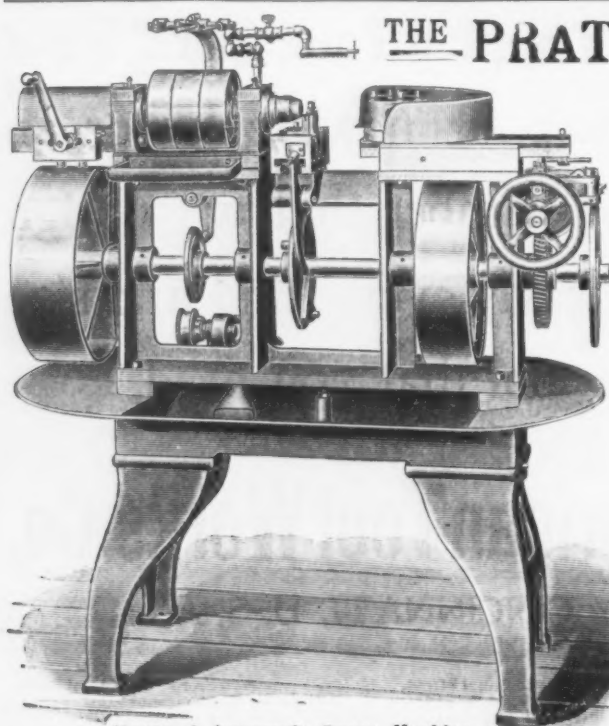
Sales Agents, FRASER & CHALMERS, Inc., Chicago, Ill., and Branch Houses.

**WINDSOR  
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Brass-Working Machinery.



Hartford Automatic Screw Machine.

## THE PRATT & WHITNEY COMPANY, HIGH CLASS MACHINE TOOLS.

### Hartford Automatic Screw Machines.

In ten sizes, for making Screws, Studs, Bicycle Hubs and other pieces of circular cross section and various outlines from bars of round, square or hexagon metal, in diameter 1-16 to 3 1-16 inches. All needed adjustments are provided for. One man can attend a half dozen machines.

Tools made to order for finishing pieces to sample.

Write for further particulars and "Hardware" Catalog.

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FOREIGN REPRESENTATIVES: London, England, Buck & Hickman, 280 Whitechapel Road; Paris, France, Fenwick Freres & Co., 21 Rue Martel; V. Lowener, Copenhagen, Denmark, and Aktiebolaget V. Lowener, Stockholm, Sweden; Dusseldorf, Germany, and Vienna, Austria, de Fries & Co.

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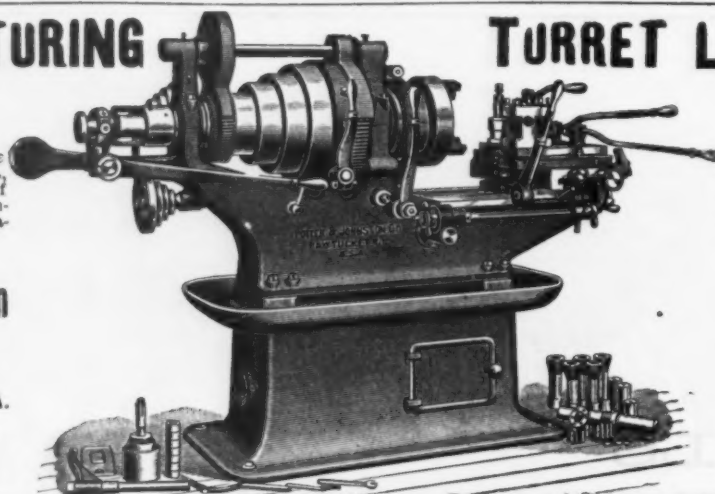
## TURRET LATHE.

THIS Lathe is made in a variety of combinations, and is adapted for all kinds of work ordinarily done on engine lathes or turret machines.

**Potter & Johnston  
Company,**

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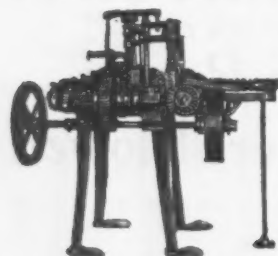
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Write for catalogue of our Universal Molding Machines and Automatic Chucking and Turning Machines.

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and Stockholm, Sweden.

The article shown on the  
opposite side was



made on this machine.

## AUTOMATIC MACHINES

or any kind of special machinery  
for rapid work . . . . .

### DESIGNED AND BUILT.

Special Power Presses, Wire Forming Machinery,  
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Machinery.

LET US KNOW YOUR NEEDS.

The A. H. NILSON MACHINE CO., Bridgeport, Conn.,  
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This difficult piece was  
made on the machine



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of this advertisement.

**GENERAL  
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**SPECIAL MACHINERY,  
EXPERIMENTAL WORK,  
HYDRAULIC MACHINERY,**

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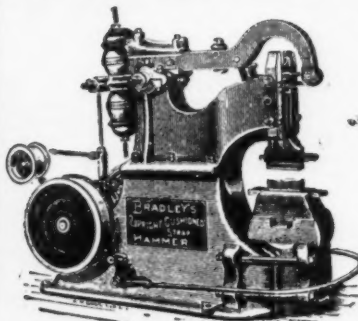
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Send for Descriptive circulars.



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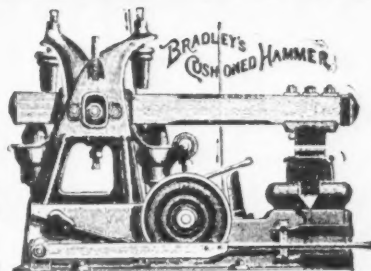
are made in Helve and Upright styles with heads weighing 15 to 500 pounds and forge stock  $\frac{1}{8}$  to 5 inches diameter.

Each contains  $\frac{1}{8}$  to  $\frac{1}{2}$  more material than any other of same rating.

Their Anvil Blocks weigh nearly or quite double those of other Hammers.

Their output is guaranteed 25 per cent. greater than is possible with other Hammers of same rating, or no sale.

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**THE BRADLEY CO.**  
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## SCREW MACHINES.

Made in 7 standard sizes, with 10 different spindle capacities ranging from  $\frac{1}{4}$  in. to  $2\frac{1}{2}$  inches with Wire Feed capacity, and from 9 16 inch to  $3\frac{1}{8}$  inches hollow spindle capacity. The largest sizes have very long Turret Feed and hole through turret which allows very long pieces to pass through turret.

Furnished with or without

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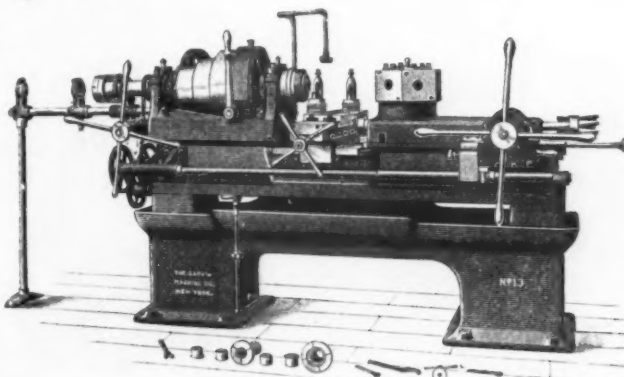
Automatic chuck,

Plain back gears,

Geared friction head,

Power feed to Turret.

Send for catalogue.



Ample power is provided for working to the limit of Capacity.

The Turret's and cross slides on the smaller sizes are worked by a lever and on the larger sizes by capstan.

The cut shows No. 13 Screw Machine with Wire Feed, Geared Friction Head, and Power Feed. The Gap bed gives wide cross slide bearing and increased swing. Bed is arranged for chips to fall into pan.

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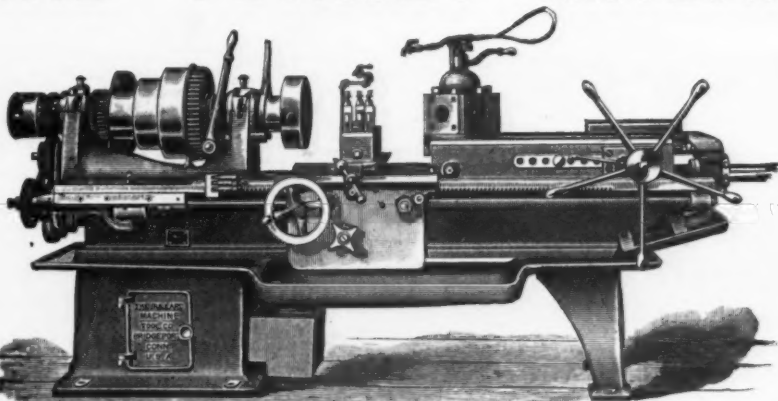
SALES AGENTS: The Garvin Machine Co., 51 No 7th St., Philadelphia, Pa. Manning, Maxwell & Moore, 22 So. Canal St., Chicago, Ill. Deutsche Garvin Maschinen-Fabrik, Aktiengesellschaft, 7 Burg Strasse, Berlin C., Germany. C. W. Burton, Griffiths & Co., Ludgate Square, Ludgate Hill, London, E. C., England. Montgomery & Co., 28 Boulevard Magenta, Paris, France.

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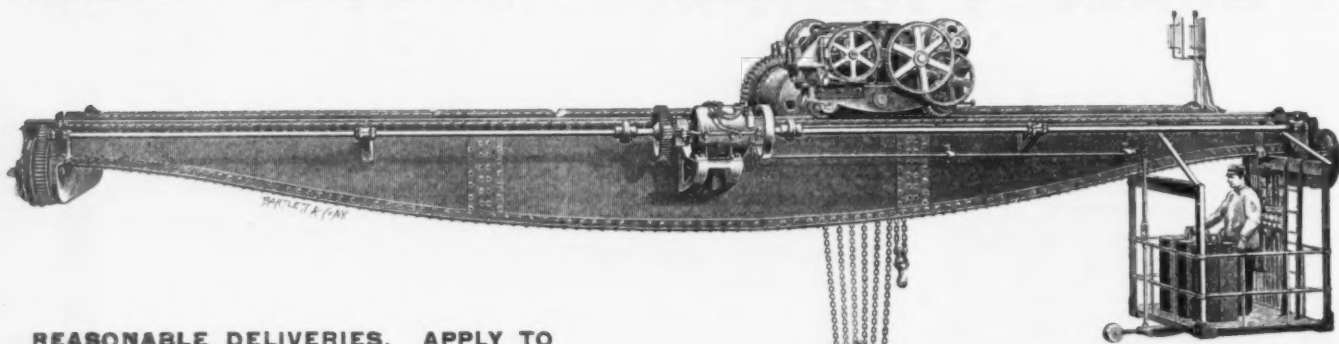
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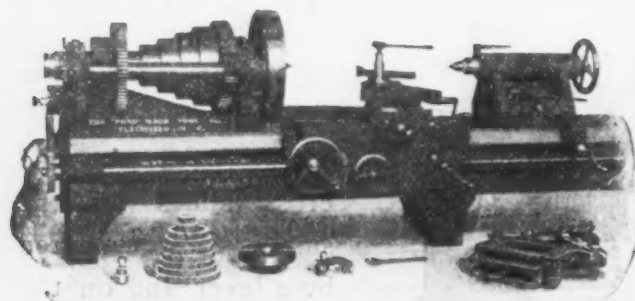
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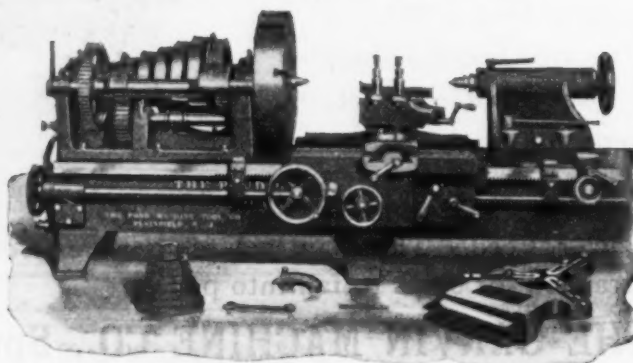
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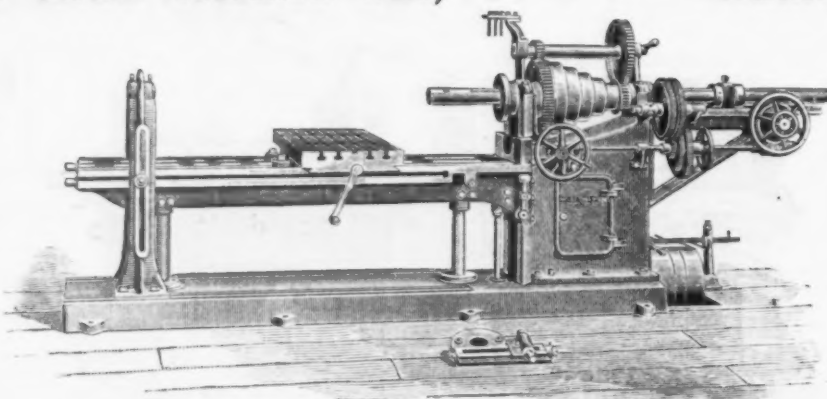


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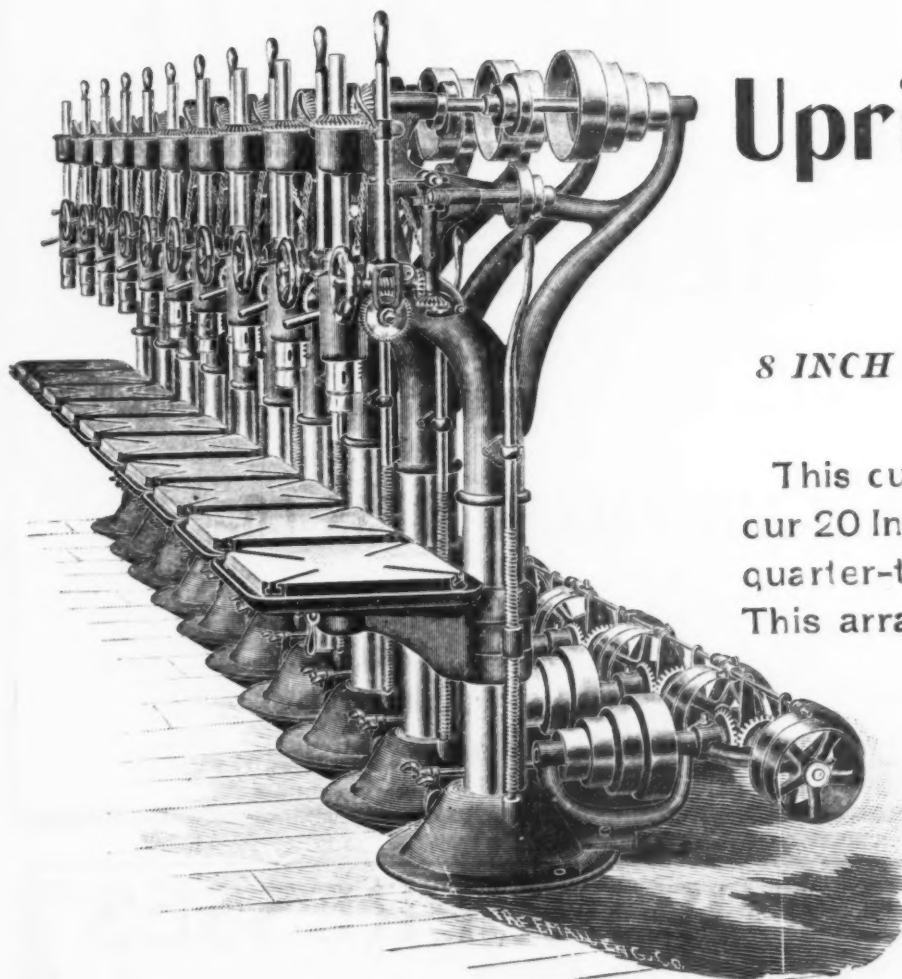
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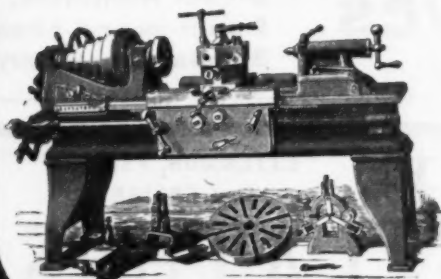
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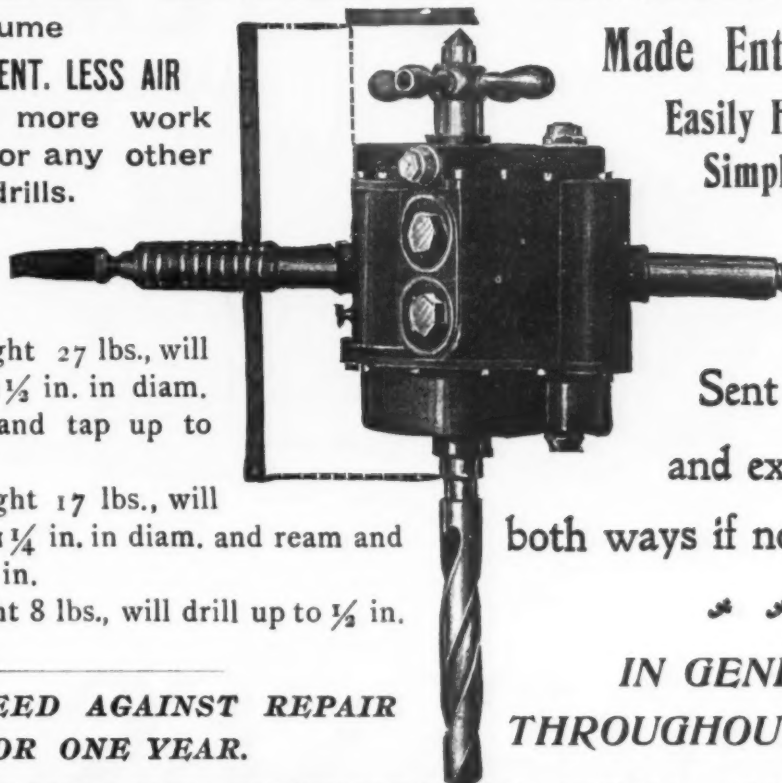
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No. 1. Weight 27 lbs., will  
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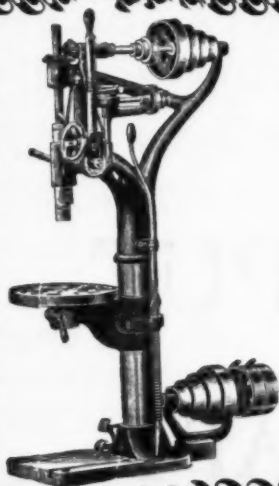
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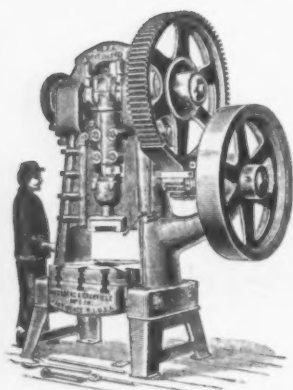
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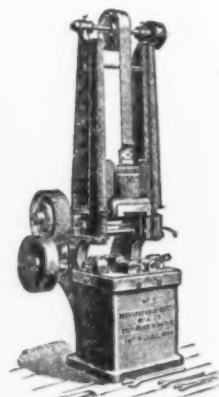
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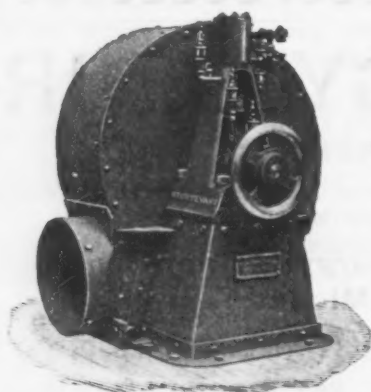


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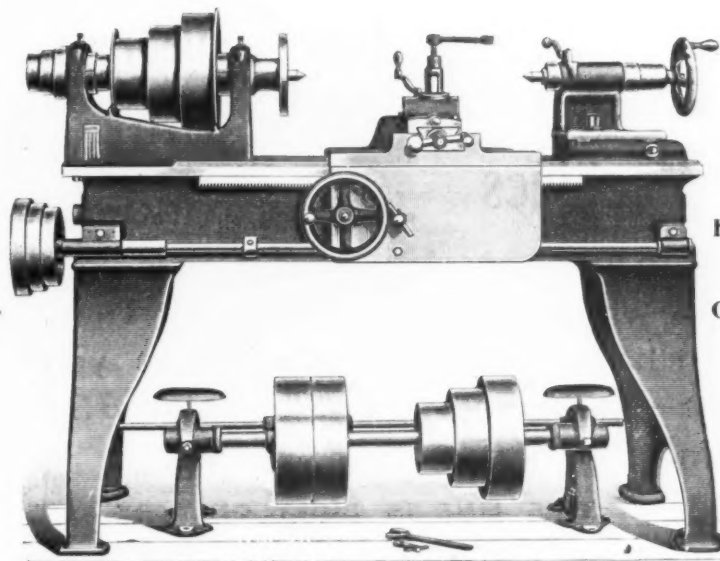
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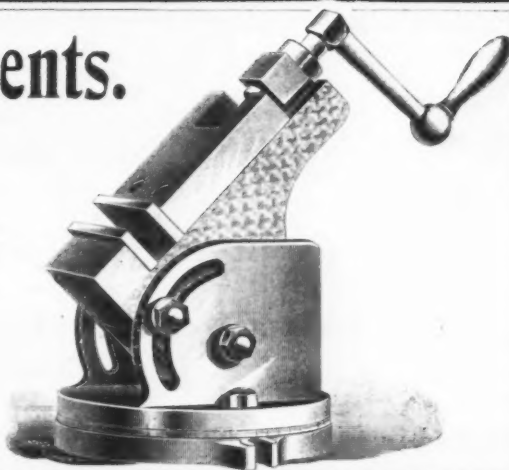
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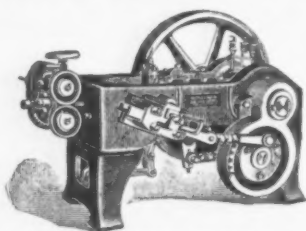
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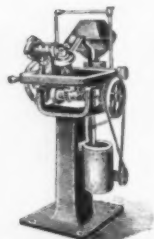
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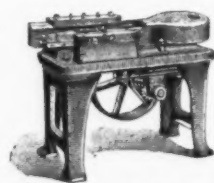
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will do the entire work at a cost for labor which would surprise you. Then, again, you can have your SCREWS just as you want them, and—more important still—just *WHEN* you want them.



SCREW SLOTTERS.

Why don't you make your own and Save Money.



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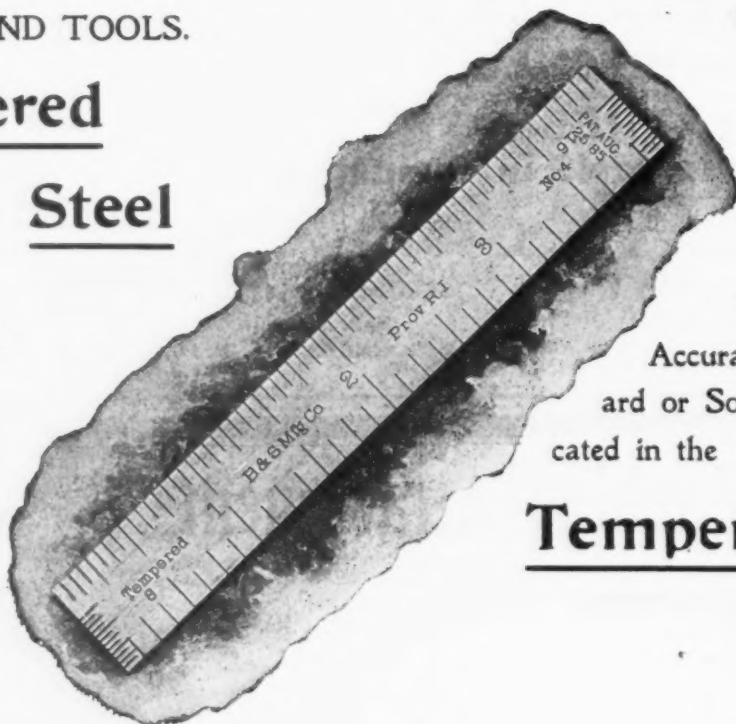
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The well known Accuracy of our Standard or Soft Rules is duplicated in the

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37 in. x 9 ft., New Haven.  
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20 x 48 in. Wheelock Corliss.  
20 x 42 in. Putnam four-valve automatic.  
18 x 20 Porter Allen four-valve automatic.  
16 x 16 in. Cooper high speed automatic.  
16 x 16 in. Green high speed automatic.  
15½ x 28 x 15 in. A. & S. Cross Cpd. auto.  
14½ x 15 in. Armstrong & Sims automatic.  
12 x 16 in. Bess high speed automatic.  
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**Norwalk Compound Belt Driven Air Compressor,**

Used about three months. Weight 7,500 pounds.  
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One 18 in.-34 in. x 42 in. Fitchburg Tandem Compound Automatic Engine.  
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One 28 in. x 48 in. Corliss Engine.  
One 26 in. x 60 in. Corliss Engine.  
One 26 in. x 48 in. Greene Engine.  
One 18 in.-30 in. x 16 in. Westinghouse Compound.  
One 22 in. x 42 in. Putnam Engine.  
One 20 in. x 42 in. Greene Engine.  
Two 14 in.-28 in. x 28 in. Cross Compound Fitchburg.  
One 15 in.-20 in. x 14 in. Ideal Compound.  
Two 15 in.-22 in. x 18 in. Westinghouse Compound.  
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Horizontal and Vertical Boilers, all sizes and descriptions.  
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Boiler and Three Drum Engine.  
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Plain and Friction Heads.

- 5 14 in. Plain, 1 5-16 hollow spindle.
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Pratt & Whitney make. Condition A1.

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2 18 x 6 Pratt & W., plain.  
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1 18 x 8 Pratt & W., plain.  
1 18 x 10 Am. F. & M Co.  
1 20 x 7 Pratt & W., plain.  
2 20 x 8 McMahon.  
1 20 x 8 Stover.  
1 2 x 8 Bullard.  
3 20 x 10 B'nd Chucking.  
2 21 x 8 Dustin & Hubbard.  
2 22 x 12 Fitchburg.  
2 26 x 12 Lathe & Morse.  
1 30 x 15 Fitchburg.  
1 32 x 14 Pond.  
1 B'ment Single Axle Lathe

**PLANERS.**

1 18 1/2 x 14 x 43 Ames Screw  
1 24 x 34 x 6 Putnam  
1 26 x 26 x 6 N.Y.S. Eng. Co.  
1 60 x 60 x 20 Fitchburg.  
1 14 ft. 6 in. Sellers Plate Planer.

**DRILLS.**

1 10 in. Bench, York.  
1 3-spindle Ames.  
1 3-spindle Garvin.  
1 20 in. Prentiss, lever feed  
1 25 in. Weeks & Halsey.  
1 30 in. New Haven.  
1 Bement & D. Upright.

**SHAPERS.**

1 9 in. Crank, Bement.  
1 12 in. Crank, Juengst  
1 15 in. Fric., Hendey.  
1 16 in. Fric., Putnam.  
1 20 in. Fric., Juengst.  
1 20 in. Fric., Juengst.

If you want to buy or sell let us know.

Send for Special List.

**MANNING, MAXWELL & MOORE,**

85-87 89 Liberty St., N. Y. City

Branches at Chicago, Pittsburgh and Cleveland.

# FOR SALE

AT DANVILLE, PA.,

# Steel and Iron Works

Valuable as adjuncts to other works. Comprising ONE COMPLETE, WELL-DESIGNED AND WELL-EQUIPPED BESSEMER STEEL PLANT. Main building, brick, iron roof; boiler house and gas house, iron buildings. Containing 2 converters, 5 tons each (room provided for third converter). Cupolas, hoists, moulds, cranes and all tools, also for blooming and billet mill, and number of duplicate parts of machinery. Boilers, air cylinders (all mostly new) to full capacity of plant. Storehouses, separate office building, and new Fairbanks self-registering track scale.

ONE ROLLING MILL equipped to roll either iron or steel plates, skelp train, furnace capacity for 80 tons. Sheared skelp, double turn; angles, squares, Tee rails, proper boilers, engine capacity, shears, saws and all appliances complete.

ONE BLAST FURNACE, 60 ft. stack, capacity 70 tons per day. New bell and hopper, 2 blowing engines, 22,000 cu. ft. per minute capacity. New pumps and boilers recently added. All tools complete.

ONE DYNAMO AND ENGINE of capacity to light entire works and yard.

Brick office with well equipped laboratory for blast furnace and Bessemer work.

ONE OPEN HEARTH, 10 ton Siemens-Martin furnace, with 6 Siemens producers, 2 hoppers each, cranes, moulds, and tools.

ONE ROLL SHOP, with engine, 2 lathes, traveling crane, and complete set of tools.

Trucks, trestles, storehouses and auxiliary buildings located on two railroad systems.

We invite bids for entire works or for separate plants.

**DANVILLE BESSEMER CO.,**

310 Land Title Building,

PHILADELPHIA, PA.







# Machinery Bargains Second-hand Tools

24 x 48 Hamilton Corliss Engine.  
18 x 42 Harris Corliss Engine.  
14 x 30 Cummer 4-valve Automatic Engine.  
14 x 14 Sutton Marine Engine.  
16 x 42 Bullock Corliss Engine.  
18 1/4 x 26 Buckeye Engine.  
12 x 15 Slide Valve Engine.  
12 x 20 Cooper Slide Valve Engine.  
Two 12 x 11 and one 9 x 9 Westinghouse Engines.  
11 x 11 Ide Vertical Engine.  
8 x 16 Rice Automatic Engine.  
600 H.P. Rowe Feed Water Heater.  
70 H.P. Otis Steel Fire Box Boilers.  
15 H. P. Gasoline Engine.  
90 H. P. Waste Heat, Vertical Boiler.

The above are all in first-class condition and ready for shipment.

A. L. DAWSON & CO.,  
27-31 W. Washington Street, Chicago, Ill.

## For Quick Delivery.

### SINGLE VERTICAL PUNCHES.

36 in. throat, 1 1/4 in. in 1 inch plate.  
30 in. throat, 3/4 in. in 1/2 inch.  
24 in. throat, 3/4 in. in 1/4 inch.

### SPLITTING SHEARS.

For 3/4 in. and 1/2 in. plate.

DOUBLE ANGLE SHEAR for 4 x 4 x 1/2 in. angles.  
Plate-edge Beveling Shear, for 3/4 in. plate.  
Gate Shear and Multiple Punch, 78 in.

BENDING ROLLS, 100 in., for 1 1/2 in. plate.

Hand Spacing Table, 8 ft.  
Radial Drills, plain, 48 in. and 60 in. arm.  
Boiler Makers' Flanging Clamps, 10 ft.  
Steam Riveter, 6 1/4 ft. gap.  
Plate Planer, 6 ft. cut.  
Duplex Vertical Engines, 9 x 9.

HILLES & JONES COMPANY,  
Wilmington, Delaware.

## Engine Bargains.

1 30 in. x 60 in. R. H. Hamilton Corliss, 15 in. shaft; 18 ft. fly wheel in 8 sections; rim 12 in. x 15 1/2 in.  
1 18 in. x 32 in. Single Cylinder Link Motion Double Drum with friction and brake band Haulage Engine, made by Webster, Camp & Lane.

The above engines are in A No. 1 condition.

For Sale by

WM. C. JOHNSON & SONS MACH'Y CO.,  
St. Louis, Mo.

## AUCTION SALE.

The complete plant of the Clay Stamping Co., Cleveland, O., including machinery, dies, patents, patterns, shop equipment, will be sold at auction if a bid of \$12,000 is made. This is a very profitable business, and was recently purchased for \$29,000. Auction sale at 11 A. M. Saturday morning, Sept. 29, 1900, at the works on Hamilton St. Address all inquiries to

GEO. H. BOWLER,

Williamson Bldg., Cleveland, O

## FOR SALE.

## Large Engine Lathe.

One 90 in. swing, 20 ft. bed Engine Lathe, triple geared. Face plate 80 in. dia. Spindle 10 in. dia. Carriage has screw feed and power cross feed. Lathe is very heavy and powerful and in first-class condition. Immediate delivery. Photograph on application.

Send for new list of large tools for immediate delivery.

WM. A. READE & CO.,

216 American Trust Bldg., Cleveland, O.

### ENGINES, STATIONARY and MARINE

2 Eaton and Prince Passenger and Freight Elevators.  
2 Upright Marine Engines; also one 14 x 18, and one 12 x 20 Horizontal Engine.  
Machinery bought, sold and erected.  
WM. GRUENDLER, 928 N. Main St., St. Louis, Mo.

## For Immediate Delivery.

1 800 lb. Merrill Drop Hammer.  
1 14 in. x 60 in. Pratt & Whitney Shaping Machine.  
1 12 in. x 60 in. Bement Shaping Machine.  
1 10 Pratt & Whitney Tool Room Lathe.  
1 No. 3 Stiles Punching Press.  
1 No. 3 Fowler Press.  
1 54 in. x 19 ft. Planer, double head.  
1 60 in. Heavy Radial Drill, 5 inch spindle.  
1 Small Horizontal Boring and Drilling Machine, Bement.  
1 12 H. P. Otto Gas Engine.  
1 No. 1 1/2 Pratt & Whitney Hand Milling Machine.  
1 No. 2 1/2 Newton Duplex Milling Mach.  
1 No. 5 Cleveland Auto Screw Machine.  
1 Lodge & Davis Screw Machine, 2 in.  
1 No. 2 Jones & Lamson Screw Machine.  
1 36 in. Hydraulic Wheel Presses.  
1 16 in. Slotting Machine

## U. Baird Machinery Co.

123-125 Water St., 124-126 First Ave.,  
PITTSBURGH, PA.

## FOR SALE.

### ENGINES, AUTOMATIC.

1 12 x 20 At as.  
4 11 x 11 Westinghouse.

### ENGINES, SLIDE VALVE.

1 16 x 24 Bovard & Seyfang.  
1 10 x 10 Russell, High Speed.

### BOILERS.

1 72 x 16, 3/4 in. flues.  
2 72 x 14, 4 in. flues.  
1 50 H. P. Upright.  
1 12 in. Shaft, 24 ft. long, with couplings.  
1 18 in. Shaft, 24 ft. long, with couplings.  
Tubing, Rods and Oil Well Casing.  
Second-hand Flues, all sizes, cleaned and cut to length.  
100,000 ft. Standard pipe all sizes.  
1 500 light Electric Machine.  
1 50 H.P. Geary Water Tube Boiler.  
1 Large Lot Pumps, different sizes.

MCDOWELL & CO.,

347 Fifth Ave., Pittsburgh, Pa.

## Wanted to Make

We have a complete modern manufacturing plant near Boston, equipped with Power Presses, Automatic Screw Machines, Nickel Plating and Polishing Plant and want to correspond with parties having articles that can be made in such a factory. Address

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Care The Iron Age, 70 Kilby Street, Boston, Mass.

## Where to Locate.

Manufacturers using iron, steel or wood will find the best locations for successful plants along the

### SOUTHERN RAILWAY.

These locations lead in cheap raw material, cheap, contented and desirable labor, cheap fuel and in good facilities for marketing products. Opportunities now open for establishing new plants are fine and should be investigated. Other investments will prove profitable in the South.

M. V. RICHARDS,

Land and Industrial Agent, Southern Railway,  
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## FOR SALE.

3 Steam Pans, 20 ft. x 8 ft., with 3 1/4 in. Steam space.

BOVAIRD & CO.,

Bradford, Pa.

## FOR SALE.

One Pond Planer, 36 x 36 x 17 ft.

One New Haven Lathe, 25 in. swing, 16 ft. bed.

One vertical Engine 14 x 14, roughtry valve, self contain.

One Sturtevant Steel Blower, 68 in. high, 26 inlet, 22 outlet.

Also one Atlas 10 x 12 Engine.

Also a large lot of iron tanks.

WM. ECKBOLDS' SONS,

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## MACHINERY.

### SECOND-HAND, FIRST-CLASS ORDER

3-16 in. Adt. Rotary Wire Straightener, five dies, with loose pulley on stand.  
25 lb. Justice Power Hammer  
50 lb. Power Hammer (Dineit & Eisenhardt).  
25 lb. Bradley Helve Hammer.  
40 lb. Bradley Helve Hammer.  
500 lb. Merrill Board Lift Auto. Drop Hammer.  
1500 lb. Morgan & Williams Double Standard Steam Hammer.  
500 lb. Pratt & Whitney Board Lift Automatic Drop Hammer.  
No. 7 Jarecki Pipe Machine.  
2 1/2 in to 12 in. Curtis & Curtis Pipe Machine.  
3-16 in. Adt. style "D" Riveting Machine.  
Garvin Single Spindle Profiler.  
No. 1 Warner & Swasey Screw Machine with wire feed.  
No. 3 Pratt & Whitney Screw Machine with wire feed.  
No. 1 Bliss Foot Press.  
Brown & Sharpe Polishing and Finishing Lathe.  
No. 2 Plain Milling Machine (Reed).  
No. 3 Hand Milling Machine (Garvin).  
No. 8 Milling Machine (Brainard).  
No. 4 Milling Machine (Brainard).  
No. 2 Diamond Wet Tool Grinder.  
No. 5 Niagara Slitting Shear.  
18 in. throat Power Punch.  
5 1/2 in. throat Power Shear.  
24 in. throat Power Shear.  
14 ft. Boiler Plate Planer.  
No. 86 Niagara Bench Screw Press.  
6 in. Boynton & Plummer Shaper.  
15 in. Hendy Shaper.  
18 in. Juengst Shaper.  
15 in. Garvin Spinning Lathe.  
10 in. and 13 in. Sensitive Drills.  
20 in. Barnes Drills.  
Plating Dynamos from 300 to 700 gallons capacity.  
Plating Tanks.  
14 in., 16 in., and 21 in. Engine Lathes.

### NEW.

Engine Lathes 12 in. to 38 in. Swing, various lengths of bed.  
10 in. to 40 in. Drill Presses, standard makes.  
Nos. 1, 2 and 3 Cincinnati Full Univ. Mill'g Machs.  
No. 2 Cincinnati and No. 2 Hisey Plain Mill'g Mchs.  
36 x 36 x 12 ft. Gray Planer with two heads.  
Write us for any machinery wanted, or what you may wish to exchange or sell.

C. C. WORMER MACHINERY CO.,

Ft. of Shelby Street, Detroit, Mich.

## FOR SALE.

Four trains of plate rolls.  
One 9 ft. Fly wheel, new 7 in. bore; weight, 6,000 lbs.

One Rod Straightening Machine, built by the Medart Patent Pulley Co. for straightening Rods up to 3 in. diameter and 25 ft. long.

A lot of extra cold and hot plate rolls, new.

HENRY A. HITTER'S SONS.

Gaul and Sergeant Sts., PHILADELPHIA.

## FOR SALE.

One 150 H. P. Cross-compound Armstrong & Sims Auto. Engine, cylinders 11 1/4 and 18 1/4 x 15.  
One 13 in. x 12 in. Phoenix Auto Engine.  
One 16 x 24 Atlas Engine.  
One 12 x 18 H. S. and G. Plain Slide Valve Engine.  
One 12 in. x 36 in. Babcock and Wilcox Engine.  
One 8 in. x 10 in. Atlas Auto. Engine, center crank.  
One 12 in. x 7 in. x 10 in. Worthington Duplex Pump.  
One 1000 lb. Ferris and Miles Steam Hammer.  
Also a number of smaller Engines and Pumps.

THE E. H. WACHS CO.,

153 Indiana St., Chicago.

## FOR SALE.

Tools lately in use in Boiler Manuf'g Plant.

1 40-ton 36 in. Gap Hydraulic Riveter.  
1 set 20 ft. Niles Rolls.  
1 13 in. x 22 in. x 13 in. Westinghouse Engine.  
1 18 in. x 54 in. x 18 in. Barr Pump for 500 lbs. pressure.

For additional information, address

ESTATE OF WM. G. WARDEN,  
1012 Witherspoon Bldg., Philadelphia.

## FOUNDRY PLANT

for sale or rent. Large capacity; fully equipped and now in operation. Railroad facilities excellent; two belt and one trunk line. Outside Chicago.

Address "FOUNDRY PLANT,"

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## INVESTMENTS

Are offered by J. H. Hillman & Son, Empire Building, Pittsburg, Pa., in the following first-class properties:

### BLAST FURNACES IN PENNSYLVANIA.

No. 1, capacity 300 tons daily, now running, making over \$5 per ton profit. Can be turned over promptly. Will pay half the cost this year.  
No. 2, capacity 200 tons daily, now running with big profit.

### LAKE SUPERIOR (Mesabi) IRON ORE Lands.

Ready for operation August 1st.

### TWO HUNDRED COKE OVENS AND Five Thousand Acres of Coal Lands in West Virginia.

### FIFTY COKE OVENS AND COAL Lands on the Main Line of Pennsylvania Railroad.

### CONNELLSVILLE COAL LANDS and Coke Ovens.

### EIGHTY COKE OVENS AND CONNELLSVILLE coal in Connelville region.

### FIFTY THOUSAND ACRES OF COALING coal adjoining Connelville region. Nine foot vein in Fayette and Greene Counties, Pa. These lands offer the best investments now before the American public.

### COAL MINING PLANT AND COAL Lands in Virginia.

Capacity 25,000 tons per annum. Now shipping East and West. Modern electric equipment. Coal is like Pocahontas smokeless used in the United States Navy. Being exported.

### FIFTY THOUSAND ACRES OF KENTUCKY Coal and Timber Land.

### WELL-KNOWN IRON PROPERTY IN Kentucky.

With well-developed ore mines and millions of tons of ore in sight and has also a large number of farms on the Cumberland and Tennessee Rivers. This property contains 40,000 acres and is a principality in itself.

### MANUFACTURING PROPERTY IN the Monongahela Valley.

### THICK VEIN COAL IN THE MONONGAHELA Valley.

### SOMERSET COUNTY COAL LANDS.

### MANUFACTURING SITE AND COAL Lands on the Allegheny River.

### CANADIAN IRON ORE MINES IN Operation.

### A MODERN ROLLING MILL.

### MANUFACTURING PROPERTIES and sites in Pittsburg and Allegheny Cities, Pa.

### FIFTEEN THOUSAND ACRES OF coal in Centre and Clinton Counties, Pa., on the Beech Creek Railroad, suitable for shipment East.

### TEN THOUSAND ACRES OF COAL on the main line of the Pennsylvania Railroad, containing four veins of coal, mostly above water. John Fulton, Mining Engineer of Johnstown, Pa., estimates over 80,000,000 tons of coal on this property. Will be sold cheap to a prompt buyer.

### A FIRST-CLASS CHARCOAL BLAST Furnace.

For full information address

J. H. HILLMAN & SON,

Empire Building,  
PITTSBURG, PA.

## BLOWER BARGAINS.

ROOTS', second hand, bought, sold or exchanged.

All my blowers are overhauled by expert blower machinists.

I do not advertise a "fake" list of blowers not in my possession; my stock is constantly changing.

Write for particulars and prices.

H. M. PAPWORTH,

Ground Floor, 109 Liberty St., New York City.

### FOR SALE

Hardware stock, store building and residence. Business established fourteen years. An exceptional opportunity will be given an immediate purchaser. Address "HARDWARE," Lock Box 250, Gettysburg, Pa.

## DESIRABLE MACHINERY

For Immediate Delivery.

### BULLARD BORING MILLS.

30 in. Swivel Turret Head.  
37 in. Double Head.  
42 in. Swivel Turret Head.

### GEAR CUTTERS:

33 in. Gould & Eberhardt, "Victoria" pattern.  
43 in. " "  
36 in. Full Universal, Brainerd.

### PLANERS.

24 in. x 24 in. x 6 ft. Pond, new pattern.  
30 in. x 30 in. x 8 ft. Pond, new pattern.  
36 in. x 36 in. x 10 ft. Cincinnati, two heads.  
36 in. x 36 in. x 14 ft. Cincinnati, two heads.

### ENGINE LATHES.

40 in. x 17 ft. Triple Geared.

### RADIAL DRILLS.

No. 2 Bickford, Full Universal.  
No. 3 Bickford, plain.

### MILLING MACHINES.

No. 2 Back geared, plain.  
No. 3 Cincinnati Universal, power feed in all directions.

### SHAPERS.

25 in. Gould & Eberhardt Extension Base, power feed in head.

Send for complete list of tools in stock.

Send for our new catalogue giving full descriptions.

### MARSHALL & HUSCHART MACHINERY CO., 62-64 S. Canal St., Chicago, Ills.

19 S. Water St., Cleveland, O.  
510 Johnson Building, Cincinnati, O.

### FOR SALE.

One 50 H.P. Tubular Boiler, 1 10 H.P. Tubular,  
1 10 H.P. Upright, 15 H.P.  
One 10 H.P. Locomotive Boiler.  
One 15 x 30 Hor. Engine 10 ft. x 16 in. Bal. Wheel.  
One 11 x 20 " " 7 ft. x 14 in. " "  
One 9 x 16 " " 6 ft. x 12 in. " "  
One 10 1/2 x 12 Centre Crank Armstrong & Sims  
Wheel Governor, two 5 ft. x 10 in. Bal. wheels.  
One 6 x 10 Centre Crank Engine.  
Write for prices.

HANNAN & FINTON, Springfield, Mass.

## THE Thomas & Lowe Mch. Co.,

DEALERS IN

## New and Second-Hand Machinery PROVIDENCE, R. I.

## SECOND-HAND MACHINERY AT SACRIFICE PRICES.

One 50 H. P. Westinghouse Compound Engine, \$350. One 35 Arc Light, T. H. Dynamo, \$250. Two 75 H. P. Horizontal Tubular Boilers, each, \$250. One Henry Martin Brick Machine, 25,000 cap., \$300. One Newton Sander (for brick works), \$100. One 20-ton Howe R. R. Track Scale, \$100. One No. 4 Delamater Steam Pump, 5 in. suc., 3 1/2 in. dis., \$100. One Cameron Steam Pump, 4 in. suc., 3 in. dis., \$50.

SCHULTZ & CO.,  
Rothschild Bldg., 14 South Broad St., Philadelphia, Pa.

## HAMMER FOR SALE.

One Cleveland Helve Hammer; weight of head and die 2,500 pounds, total weight about 50,000 pounds; 26 inch steam cylinder. In good order. Suitable for slabs, axles, etc., for railroad or general work.

COOKE LOCOMOTIVE & MACHINE  
COMPANY,  
Paterson, N. J.

## CUPOLAS, CRANES, LADLES, BLOWERS,

and all other Foundry Equipment, new and second-hand. Send us list of your wants.

The J. D. Smith Foundry Supply  
Company,  
CINCINNATI, O.

## BARGAIN

Immediate Delivery.

One 42 in. x 8 ft. Ingersoll Slab Milling Machine, second-hand, in fine condition. Photograph, specifications and price on application.

MCDOWELL, STOCKER & CO.,

59 & 61 So. Canal St., Chicago.

### For Sale-Bargains.

50 H. P. Horizontal Tubular Boilers, guaranteed.....\$225  
14 x 20 Slide Valve Engine.....200  
Belt Power Elevator and Platform.....120  
100 H. Austin Feed Water Heater.....120  
100 H. Receiving Tank, 150 lbs. test.....60  
18 x 6 "New Haven" Lathe.....85  
36 in. "Stevens" Pulley Lathe.....75  
60 in. "Huyett & Smith" Ventilating Fan.....40  
10 H. P. Upright Side Crank Engine, new.....70  
15 H. Submerged Flue Upright Boiler.....20  
No. 3 "Sturtevant" Blower.....18  
No. 1 "Sturtevant" Blower, new.....12  
Slate Sensitive Drill and Chuck.....25  
20 in. x 20 in. x 4 feet Iron Planer, not complete.....15  
12 H. P. Kimble Automatic Upright C. C. Engine.....80  
10 H. "Erie City" Upright Boiler, complete.....75  
15 H. Upright Boiler, complete with fittings.....80  
4 ft. x 15 in. Planer Chuck, heavy.....15  
12 in. Upright Drill.....15  
10 H. Sterling Charter Gas Engine.....200  
Wire Straightener.....10  
Strapper and Belt complete, new.....12  
Berryman Heater, 24 in. x 100 in., almost new.....100  
and many others.

PARADOX MACHINERY CO., 181 E. Division St., Chicago.

## PARTIAL LIST OF SECOND-HAND MACHINERY IN STOCK.

1 60 H. P. 54 in. x 16 ft. Tubular Boiler.  
2 125 H. P. 66 x 18 Tubular Boilers.  
1 100 H. P. Locomotive Boiler.  
1 100 H. P. Baker Automatic 14 x 20.  
1 100 H. P. Atlas Automatic Engine.  
1 150 Buckeye Automatic Engine, 16 x 28.  
1 125 Buckeye Automatic Engine, 14 x 16.  
1 100 H. P. Ball Automatic Engine, 16 x 12.  
1 30 H. P. 8 x 10 Payne Auto Engine.  
1 No. 12 Morris Centrifugal sand Pump, direct connected to 12 in. vertical engine.  
2 No. 6 Morris Centrifugal Sand Pumps.  
1 12 x 12 x 10 Worthington Duplex Pump.  
1 7 x 4 1/2 x 10 Worthington Duplex Pump.  
1 Deane Duplex Power Pump, 5 in. plungers.

RAINIER & WILLIAMS,

64 So. Canal Street, Chicago, Ill.

## BARGAINS IN SECOND-HAND Electrical Machines.

### SPECIAL LIST NO. 1.

#### Arc Dynamos.

2 American Wood, 30 light, 2,000 c. p.  
1 Western Electric, 30 " 2,000 c. p.  
1 T. H. L. D 2- 35 " 2,000 c. p.  
1 Ft. Wayne Wood No. 6, 35 light, 1,200 c. p.  
1 Ft. Wayne Wood No. 8, 75 light, 1,200 c. p.

#### Alternators.

2 3 A. Slattery, 1,300 light, with exciters.  
2 A35 T. H., 650 light, composite wound, with exciters.

#### Direct Current, 110 Volts.

2 Edison 60 K. W., 1,100 light.

Send for Complete List of

Dynamos Generators, Motors, Instruments, Switches, Lamps, etc.

STEWART ELECTRICAL CO.,  
S E. Cor. Fifth and Sycamore,  
CINCINNATI, O.



## Machinery Bargains Second-hand Tools

24 x 48 Hamilton Corlies Engine.  
18 x 42 Harris Corlies Engine.  
14 x 30 Cummer 4-valve Automatic Engine.  
14 x 14 Sutton Marine Engine.  
16 x 42 Bullock Corlies Engine.  
18½ x 36 Buckeye Engine.  
12 x 18 Slide Valve Engine.  
12 x 30 Cooper Slide Valve Engine.  
Two 12 x 11 and one 9 x 9 Westinghouse Engines.  
11 x 11 Ide Vertical Engine.  
8 x 16 Rice Automatic Engine.  
600 H.-P. Rowe Feed Water Heater.  
70 H.-P. Otis Steel Fire Box Boilers.  
15 H. P. Gasoline Engine.  
90 H. P. Waste Heat, Vertical Boiler.

The above are all in first-class condition and ready for shipment.

A. L. DAWSON & CO.,  
37-31 W. Washington Street, Chicago, Ill.

### For Quick Delivery.

#### SINGLE VERTICAL PUNCHES.

36 in. throat, 1¼ in. in 1 inch plate.  
30 in. throat, ¾ in. in ½ inch.  
24 in. throat, ¾ in. in ½ inch.

#### SPLITTING SHEARS.

For ¾ in. and ½ in. plate.

**DOUBLE ANGLE SHEAR** for 4 x 4 x ½ in. angles.  
Plate-edge Beveling Shear, for ¾ in. plate.  
Gate Shear and Multiple Punch, 78 in.

#### BENDING ROLLS, 100 in., for 1¼ in. plate.

Hand Spacing Table, 8 ft.  
Radial Drills, plain, 48 in. and 60 in. arm.  
Boiler Makers' Flanging Clamps, 10 ft.  
Steam Riveter, 6½ ft. gap.  
Plate Planer, 6 ft. cut.  
Duplex Vertical Engines, 9 x 9.

HILLES & JONES COMPANY,  
Wilmington, Delaware.

### Engine Bargains.

1 30 in. x 60 in. R. H. Hamilton Corlies, 15 in. shaft; 18 ft. fly wheel in 8 sections; rim 12 in. x 15½ in.  
1 18 in. x 32 in. Single Cylinder Link Motion Double Drum with friction and brake band Haulage Engine, made by Webster, Camp & Lane.

The above engines are in A No. 1 condition.  
For Sale by

WM. C. JOHNSON & SONS MACH'Y CO.,  
St. Louis, Mo.

## AUCTION SALE.

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GEO. H. BOWLER,  
Williamson Bldg., Cleveland, O

### FOR SALE.

## Large Engine Lathe.

One 90 in. swing, 20 ft. bed Engine Lathe, triple geared. Face plate 80 in. dia. Spindle 10 in. dia. Carriage has screw feed and power cross feed. Lathe is very heavy and powerful and in first-class condition. Immediate delivery. Photograph on application.

Send for new list of large tools for immediate delivery.

WM. A. READE & CO.,

216 American Trust Bldg., Cleveland, O.

#### ENGINES, STATIONARY and MARINE

2 Eaton and Prince Passenger and Freight Elevators.  
2 Upright Marine Engines; also one 14 x 18, and one 12 x 20 Horizontal Engine.  
Machinery bought, sold and erected.  
WM. GRUNDLER, 928 N. Main St., St. Louis, Mo.

### For Immediate Delivery.

1 800 lb. Merrill Drop Hammer.  
1 14 in. x 60 in. Pratt & Whitney Shaping Machine.  
1 12 in. x 60 in. Bement Shaping Machine.  
1 10 Pratt & Whitney Tool Room Lathe.  
1 No. 3 Stiles Punching Press.  
1 No. 3 Fowler Press.  
1 54 in. x 19 ft. Planer, double head.  
1 60 in. Heavy Radial Drill, 5 inch spindle.  
1 Small Horizontal Boring and Drilling Machine, Bement.  
1 12 H. P. Otto Gas Engine.  
1 No. 1½ Pratt & Whitney Hand Milling Machine.  
1 No. 2½ Newton Duplex Milling Mach.  
1 No. 5 Cleveland Auto Screw Machine.  
1 Lodge & Davis Screw Machine, 2 in.  
1 No. 2 Jones & Lamson Screw Machine.  
1 36 in. Hydraulic Wheel Presses.  
1 16 in. Slotting Machine

## U. Baird Machinery Co.

123-125 Water St., 124-126 First Ave.,  
PITTSBURGH, PA.

### FOR SALE.

#### ENGINES, AUTOMATIC.

1 12 x 20 Atlas.  
4 11 x 11 Westinghouse.

#### ENGINES, SLIDE VALVE.

1 16 x 24 Bovard & Seyfang.  
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1 72 x 16, 3¼ in. flues.  
2 72 x 14, 4 in. flues.  
1 50 H. P. Upright.  
1 12 in. Shaft, 24 ft. long, with couplings.  
1 18 in. Shaft, 24 ft. long, with couplings.  
Tubing, Rods and Oil Well Casing.  
Second-hand Flues, all sizes, cleaned and cut to length.  
100,000 ft. Standard pipe all sizes.  
1 500 light Electric Machine.  
1 50 H. P. Geary Water Tube Boiler.  
1 Large Lot Pumps, different sizes.

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3 Steam Pans, 30 ft. x 8 ft., with 3¼ in. Steam space.  
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One Pond Planer, 36 x 36 x 17 ft.  
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One vertical Engine 14 x 14, roughtry valve, self contain.  
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Also one Atlas 10 x 12 Engine.  
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Plating Dynamos from 300 to 700 gallons capacity.  
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Nos. 1, 2 and 3 Cincinnati Full Univ. Mill'g Machs.  
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36 x 36 x 12 ft. Gray Planer with two heads.  
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Four trains of plate rolls.  
One 9 ft. Fly wheel, new 7 in. bore; weight, 6,000 lbs.  
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One 150 H. P. Cross-compound Armstrong & Sims Auto. Engine, cylinders 11½ and 18½ x 15.  
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Tools lately in use in Boiler Manuf'g Plant.

1 40-ton 36 in. Gap Hydraulic Riveter.  
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- 1 Horizontal Tubular, 72 in. x 16 ft., with 84 3/4 in. tubes, approved for 100 lb. pressure, complete.

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- Very fine steel self-supporting stack, 64 in. diam., 100 ft. high, with base casting, ornamental top and ladder.

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Locomotives, Horizontal and Upright Engines, Boilers, Pumps, Cars, Relaying Rails, Hoisting Engines, and lot of other material.

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- 7 Contractors' Plows, No. 99 "Syracuse."
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- 1 Portable Saw Mill, complete.
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SMITH & CAFFEY,

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- 2 Boilers, 350 H.-P. 2 High Speed Engines 16 in. x 16 in.
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One Compound Non-Condensing Dean of Holyoke Duplex Pump. Cylinders 20 x 30 and 16 x 24. Can be fitted for condensing on request. This pump has never been used, was built for an elevator system which was changed at last moment and pump was not needed. The capacity of this pump is 3,000,000 gallons per day against 200 pounds pressure. This pump can be bought very cheap. For further particulars, address

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**WORK WANTED.**

Large Machine Shop and Foundry fully equipped with tools suitable for heavy work similar to steam Engines, desires to correspond with parties who have machinery to build. Capacity of shop, 75 men. Modern equipment.

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To buy a new or second-hand, in good order, Saw Mill, complete with edgers and cut-offs; also outfit for Planing Mill. Address

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- A 396 5 9 in. turret speed lathe, 4 ft. 6 in. bed.
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- A 398 1 8 in. turret lathe, 5 ft. bed.
- A 399 1 7 in. turret lathe, 5 ft. bed.
- A 400 1 6 in. turret speed lathe, 4 ft. bed.
- A 401 2 speed lathes, 4 ft. 6 in. bed, 12 in. swing.
- A 402 2 special brass turning lathes, 12 in. swing, 4 ft. bed.
- A 403 1 speed lathe, 4 ft. bed, 14 in. swing.
- A 404 1 6 in. turret speed lathe, 4 ft. bed, 13 in. swing.
- A 405 1 speed lathe, 5 ft. bed, 14 in. swing.
- A 406 2 extra heavy turret speed lathes, 4 ft. bed, 16 in. swing.
- A 255 1 screw cutting engine lathe, 18 in. swing, 8 ft. bed, Pratt & Whitney.
- A 256 1 ordinary metal lathe, 20 in. swing, 7 ft. bed.
- A 257 1 Ames screw cutting engine lathe, 16 in. swing, 6 ft. bed.
- A 258 2 Shepard engine lathes, 20 in. swing, 10 ft. bed.
- A 260 1 Pond engine lathe, 14 in. swing, 5 ft. bed.
- A 261 1 16 x 5 Ames engine lathe.
- A 262 1 ordinary metal lathe, 10 in. swing, 4 ft. bed.
- A 263 Pratt & Whitney engine lathe, 18 in. swing, 8 ft. bed.
- A 264 1 speed lathe, 6 in. swing, 4 ft. bed.
- A 266 Franklin plain engine lathe, 20 in. swing, 4 ft. bed.
- A 267 1 special lathe for wood working, 18 in. swing, 5 ft. bed.
- A 268 1 special wood working lathe, 4 ft. bed.
- A 2632 1 ordinary metal lathe, 10 in. swing, 4 ft. bed.
- A 2031 1 ordinary metal lathe, 20 in. swing, 8 ft. bed.

**ENGINES.**

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- A 2 10 1/2 x 24 slide valve.
- A 3 6 x 7 upright.
- A 4 60 H.-P. Raymond gasoline.
- A 5 8 x 12, two double cyl. hoisting, made by Webster, Camp & Lane.
- A 6 6 x 8 F. D. Rice patent automatic.
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- A 8 12 x 18 slide crank.
- A 9 14 x 20 Struthers, Wells & Co.
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- A 11 12 x 16 slide crank.
- A 12 9 x 12, 10 Tift 16 H.-P. reversible.
- A 13 30 H.-P. Warren reversible.
- A 14 13 x 18, 4 valve Russell.
- A 15 14 x 20 single valve Russell.
- A 16 18 x 16 slide crank.
- A 17 14 x 14 Ideal.
- A 18 10 x 16 Erie Bail.
- A 19 7 x 8 upright.
- A 20 12 x 13 1/2 Westinghouse.
- A 21 6 x 10 slide valve.
- A 22 11 x 10 upright.
- A 23 66 x 20 Chandler & Taylor.
- A 24 7 x 7 slide valve.
- A 25 12 x 20 x 14 Ball compound.
- A 26 13 x 22 x 12, 2 Westinghouse compound.
- A 27 4 x 5 Westinghouse, Jr.
- A 28 8 x 12 Atlas.
- A 29 6 x 12 Rlymyer.
- A 30 9 x 14 Woodbury.
- A 31 6 x 10 Westinghouse, Jr.
- A 32 24 x 54 slide crank.
- A 33 8 x 16 Russell-Gibbs.
- A 34 9 x 14 slide crank.
- A 35 8 x 14 center crank.
- A 36 18 x 28 Nicol, Burr & Co.
- A 37 6 x 10 slide crank.
- A 38 21 x 32 Watertown.
- A 39 7 x 10 slide crank.
- A 40 14 x 24 slide valve.
- A 41 14 1/2 x 13 Armstrong & Sims.
- A 42 6 x 8 Ottumwa.
- A 43 10 x 18 automatic.
- A 44 6 x 12 slide crank.

- A 45 12 x 12 Westinghouse.
- A 46 9 x 16 link motion.
- A 47 12 x 12 Ideal.
- A 48 12 x 12 slide valve.
- A 49 10 x 12 Wright & Adams.
- A 50 22 1/2 x 36 Wright automatic cut off, left hand Corliss; bed, 8 ft. long 3 ft. wide; shaft, 8 ft. 6 in. long.
- A 51 9 x 14 center crank.
- A 52 12 x 16 slide crank.
- A 53 10 x 16 center crank.
- A 54 10 x 14 slide crank.
- A 55 16 x 36 gear valve motion.
- A 56 5 H.-P. Otto gas.
- A 57 100 H.-P. Westinghouse automatic compound.

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We have purchased from ARMOUR & CO., Chicago, their entire boiler outfit, which has been sold to us, owing to the change of their motive power from steam to electricity. They are all in excellent condition, and we have repaired and replaced any defective parts or tubes. They are horizontal tubular, extra strong built, and consist of the following: 48 60 x 18, 12 60 x 16, 12 54 x 16. We have other kinds of boilers also, and will send our complete list on application. They range in size from 6 H.-P. up to 600 H.-P.

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Write for our catalogue of electrical supplies. We can save you money.

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- A 66 1 No. 10 Buffalo blower.
- A 67 1 No. 8 Buffalo blower.
- A 68 1 10 in. Champion blower.
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- A 70 2 No. C14 Chattanooga blowers.
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- A 76 2 No. 4 Stillwell-Bierce heaters.
- A 77 2 No. 13 Barragawanath heaters.
- A 78 2 36 in. turbine water wheels.
- A 79 1 10 ft. x 6 ft. rendering tank.
- A 80 2 pulverizers, 24 in. diameter.
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- A 415 1 single spindle boring machine, 24 in.
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5000 tons in stock. Moderate prices. Send for stock sheet and quotations.

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- 1 13 x 5 Speed Lathe, second-hand.
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- 1 11 x 4 Wright Speed Lathe.
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- 1 Nickle Joint Foot Press, second-hand.
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- 1 No. 5 Diamond Grinder, on column, second-hand.
- 1 No. 3 Diamond Polishing Machine, on column, second-hand.
- 2 No. 4 Diamond Polishing Machines, on column, second-hand.
- 1 Wells Bros. Cutter and Reamer Grinder.
- 1 Garvin Bench Cutter and Reamer Grinder, second-hand.
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- 1 8 in. Bogard Mandrel Block.
- 1 90 in. Wheel and Lever Prentice Drill, power feed, automatic stop.
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All Kinds of Metal Working Presses  
Bought, Sold and Exchanged.

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- Bliss No. 12 Power Press, double acting.
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- Both have Peak automatic lifts.
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- 12 Foot Presses, large beds and opening in beds.
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- 15 Open Front Screw Presses and many others.

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Of same in staple cast iron wares or sheet metal goods (light or heavy), who may desire to change locations for all-round better facilities and inducements, please communicate.

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- 40 " Steel " "
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- 1 26 x 26 x 8 Planer.
- 1 18 x 18 x 5 Planer, with chuck.
- 1 16 in. D. T. quick stroke Shaper, Gould & Eberhardt.
- 1 12 in. Shaper, heavy machine, Michels.
- 1 36 in. heavy Bk. Gd. Drill Press, Massinet Mfg. Co.
- 1 20 in. Back Geared Drill Press and Chuck, Davis.
- 1 18 in. Sensitive Drill and Chuck, W. & R.
- 2 No. 2 Garvin Screw Machines.
- 1 Gray Screw Machine.
- 1 13 in. x 6 ft. bed, No. 6 Barnes Engine Lathe and Counter Shaft.
- 1 24 in. x 16 ft. Engine Lathe.
- 1 24 in. x 12 ft. " "
- 2 24 in. x 10 ft. " "
- 2 20 x 8 Engine Lathe, chain feed, \$30.00.
- 1 18 x 8 " " Michels.
- 1 16 x 6 " " Blaisdell.
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- Eye Beams, from 4 ins. (7 1/2 lbs.), to 20 ins. (65 lbs.)
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IRON AND STEEL SCRAP.

IRON AND STEEL RAILS, PIG IRON, ETC..

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In carload lots.

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- 200 tons 40 lb. Steel, with Splices.
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- 100 BOX CARS, 50,000 lbs. capacity; equipped M. C. B. couplers, Air-brakes.

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## FOR SALE. Relaying Rails.

- 35 tons of 35 lb. steel, with splices.
- 80 tons of 45 lb. steel, with splices.
- 150 tons of 56 lb. steel, with splices.
- 86 tons of 62 lb. steel.

Tidewater delivery.

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New Light Rails.

Relaying Rails.

Rails cut to order.

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Dealers in old iron and metals; also new and second-hand iron and wood working machinery.

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We reduce to merchantable size large pieces of iron and steel scrap. Will buy scrap of this kind. Correspondence solicited.

BIRDSBORO IRON & STEEL  
BREAKING CO., Ltd.,  
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72 in. Long & Allstatter Gate Shear and Punch. Used only ten days.

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1. An Upright Slide Valve Engine, 30 x 30, complete with 12 foot by 30 inch balance band wheel and Judson governor. This engine also has a 16 x 20 cylinder with steam chest.
  2. A Corliss Upright Engine, 30 x 48, with 30 feet sectional fly wheel.
- Also, One 4 and two 6 in. Judson governors, complete and in excellent order.

PENN IRON CO., Lancaster, Pa.

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An established concern, dealing in Machinery Supplies, etc., in the South, is in a position to sell new Shafting, Pipe, Pulleys, Pillow Boxes, Hangers, etc., in connection with their second-hand machinery department. Will be pleased to hear from manufacturers in these lines desiring to establish Southern connections.

E. O. MILES & CO.,  
278-298 Marietta St., Atlanta, Ga.

**WANTED.**

A second-hand Punch and Shear, that will cut  $\frac{1}{2}$  x 3, and punch  $\frac{1}{2}$  in. hole in  $\frac{1}{2}$  in. material.

WM. R. PERRIN & CO.,  
Chicago, Ill.

I HAVE a new rotary engine endorsed by a well-known Boston mechanical engineer and wish to make arrangements for putting same on market. Will sell one-third interest cheap. Money to go to producing the engine. For particulars address  
H. M. HARDIE, 34 India St., Boston.

**Water Pipe FOR SALE.**

About 15,000 feet 20 in. Cast Iron Water Pipe made by R. D. Wood & Co., 170 lbs. to foot, in 12 ft. lengths, in first-class condition for re-use.

Will be sold in lots to suit.

FRANK SAMUEL,  
Harrison Bldg., Philadelphia, Pa.

**BERKSHIRE IRON YARD,**

H. H. ROGER 5, Owner.

**Scrap Iron, Metals, Etc.**

221-223-225 Housatonic Ave.,  
BRIDGEPORT, CONN.

TELEPHONE.

**WANTED.****SCRAP STEEL.**

Give description and lowest spot cash price delivered Phila., Pa.

F. GREINER, 406 Drexel Building,  
PHILADELPHIA, PA.

**Wagon Tires,**

STEEL OR IRON,  
RD. EDGE OR SQUARE.

Angles Up To Four Inch.

LOGAN IRON & STEEL CO.,  
BURNHAM, PA.

Buyers of Scrap for Cash.

# Special Screw Machine Work Wanted.

We are fully equipped with latest appliances for handling this work, especially that required for Bicycle or Automobile manufacture, and are prepared to quote low prices for those interested. Estimates for this class of work gladly furnished on application. Correspondence solicited.

## J. STEVENS ARMS AND TOOL CO.,

P. O. Box 46,

CHICOPEE FALLS, MASS.

I buy Iron and Metal Scrap and wish to hear from anybody having cotton ties, pipe, hoops, cast borings, wrought and steel turnings, boilers, cast scrap, etc. Also wrecks from fire, etc.

ROBERT M. CUNLIFFE,  
1140-42 Washington Ave., Phila., Pa.

**PARTNER WANTED.**

The advertiser wishes to establish a large well equipped plant for the manufacture of machine tools for the American and foreign markets, and wishes to associate himself with a capable business man able to contribute at least \$100,000, and who would be able to take the financial management. The advertiser at present controls work sufficient to keep 250 men employed, a large part of which can be turned over to the new company. It is the advertiser's intention to take advantage of all the latest developments in manufacturing methods and to establish a plant unsurpassed for efficiency of production. Address "T. B. M.," 890, care *The Iron Age*, New York.

**Hardware Stock For Sale**

In the best town in Northern Ohio. Other business interests reason for selling. Address

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**FOR SALE.**

One Hundred Open Top Square Iron Tanks. Mounted on wheels. Capacity of each, 22 cubic feet, or 166 gallons. For blue prints and prices send to

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**WANTED TO BUY OR LEASE.**

Medium size Machine Plant, well equipped for the mfg. of engines, pumps, etc., western Penn. preferred.

Address "MACHINE PLANT,"

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**WANTED.**

I will pay cash for Job Lots and Bankrupt Stocks of Hardware, Furniture, Bicycles and Sundries, in fact, all Bankrupt Stocks of any description. Address

FRANK F. BAEL, Rome, N. Y.

**FOR SALE.**

Keeler Boiler 60 in. x 16 ft., also Murphy Smokeless Furnace. Excellent condition.

"T. E. M.," P. O. Box 1145, New York.

**FOR SALE.**

A 1 stock of hardware in the best town in Southern Michigan. A bargain for cash. Address

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**E. BISSELL & CO.,**

WHOLESALE

**HARDWARE AUCTIONEERS,**

12 Murray St. and 15 Park Place, N. Y.

Sales held weekly for the trade. Consignments solicited. We refer to the leading manufacturers and importers.

TELEPHONES 2440, 2441 AND 2442 BROAD.  
**B. NICOLL & COMPANY,**  
59 AND 61 WALL STREET, NEW YORK.  
**WIRE RODS,  
BILLETS.  
IRON ORE AND MILL CINDER.  
FOUNDRY, FORGE, BESSEMER and BASIC PIG IRON.  
Steel and Iron Scrap for Open-Hearth Furnaces Bought and Sold.  
Furnace Agents, Exporters and Importers.**



## TRUSTEE'S SALE

— OF —

### Estate of Vulcan Foundry Co.,

PAWTUCKET, R. I.

Will be sold at public auction on Thursday, Sept. 27, A.D. 1900, at 10 o'clock a.m., on the premises, all that tract of land containing about 59,000 square feet situated at the corner of Woodbine and Freight streets, at Dartington, Pawtucket, R. I., with all the improvements thereon, consisting of a three-story brick building containing 18,000 square feet of floor space and fully fitted up as a brass foundry and machine shop, pattern room, offices, carpenter shop and iron finishing department; also a connected brick and wooden building containing 10,800 square feet of floor space and thoroughly equipped as an iron foundry; also flask and sand sheds and stable, together with all machinery and fixtures, tools and supplies, horse, wagons and stable equipment, office safe, furniture and supplies, patterns, 3 motors, boiler, and all other contents of said buildings. These improvements were wholly constructed in 1897, and the entire property is in first-class condition and ready to be started up at once. The plant is connected with India Point branch railroad by side track fitted with Fairbanks 80-ton, 40-foot platform scales, and has on the premises an artesian well of fine quality water 257 feet deep supplying all departments. The buildings are also connected with city water and sewer, and are equipped with sprinkler system, electric wiring and watchman's clock. The entire property is valued at \$75,000.

This will be a great opportunity for parties desiring to purchase a first-class modern foundry thoroughly fitted in every respect for the manufacture of iron and brass castings and electric railway material, this latter department having been organized and operated under the name of Pawtucket Brass Foundry. A complete list of the property can be seen at the office of the company upon application to the trustee.

Terms: 5 per cent. of purchase price in cash or certified check to be paid on the premises at time of sale and balance in cash on delivery of deed within one week thereafter.

FRANK J. POWERS,  
Trustee in Bankruptcy.

### — Also —

At same time and place and on same terms and conditions will be sold at public auction all that tract of unimproved land containing 50,000 square feet, situated at corner of Woodbine and Sabin streets, and adjoining above described property of said Vulcan Foundry Co. This land was formerly owned by the bankrupt estate and is clear and level. It is a most desirable location and is worth \$12,500.

## PRESSURE BLOWER WANTED.

No 4 or No. 5 Root or other make of equal capacity. State price and condition fully. Address

"FOUNDRY,"  
care *The Iron Age*, New York.

## I WANT CAPITAL

To increase my business. Splendid location, exceptional opportunity and will pay 8 per cent. or take silent partner or form corporation. Hardware, Toys and Fancy Goods. Address

"TOY,"  
care *The Iron Age*, New York.

## FOR SALE.

A complete nickel plating plant including dynamo, polishing lathes, buffing lathe, bull neck wheels, tanks and solution. Write for particulars to

ELECTRIC OIL STOVE CO.,  
Jackson, Mich.

## FOR SALE.

7 H.-P. Otto Gas Engine. Perfect condition. Good as new. Cheap.

H. E. PERRY, 9923 Union Ave., Chicago.

## A FIRST-CLASS HOUSE

of the highest financial standing of Germany wishes to undertake, for

Europe or Germany,

the sole right of selling for first-class

## American Machine Manufactories

which are not yet permanently represented or wish to make a change.

Please send particulars with catalogues to

"H-100,"

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## Factory Site for Sale.

At Carteret, N. J., 13 Miles from City Hall, New York.

Consisting of 25 Acres, 675 ft. front on tide water ample for ocean steamers; railroad on property and within 1½ miles of Penn., Lehigh, Philadelphia & Reading and Baltimore and Ohio Railroads; unlimited supply of purest water for boiler and drinking purposes, under 85 lbs. pressure, with 12 inch main on property.

EDWARD S. SAVAGE,

31 Nassau St., N. Y. City.

## WANTED,

FOR IMMEDIATE SHIPMENT.

One second hand gear cutter, that will cut to 12 inches diam. Address the  
RICHARD MFG. CO., Bloomsburg, Pa.

## ENGINES FOR SALE.

2 34 x 60 Horizontal Corliss Engines.  
1 24 x 56 Horizontal Corliss Engine.  
1 24 x 30 Piston Valve Engine.

W. J. CARLIN COMPANY,

610 and 611 Lewis Bldg., Pittsburg, Pa.

NEW YORK OFFICE:

514-515 Park Row Bldg., New York, N. Y.

## FOR SALE.

One 10 inch Bar Mill, One 18 inch Bar Mill.  
W. J. CARLIN COMPANY,  
610-611 Lewis Bldg., Pittsburg, Pa.

NEW YORK OFFICE:

514-515 Park Row Bldg., New York, N. Y.

## WANTED.

10 Wire Nail Machines for the purpose of cutting 16 to 30 wire, making brads, etc. Address

"M. M." care Pedro Treviro, Monterey, Mexico.

## Wanted.

Seven foot Boring and Turning Mill. Modern design.

MURRAY IRON WORKS CO.,

Burlington, Iowa.

## TO REPRESENT.

An Engineering Concern with headquarters in Philadelphia would like to represent manufacturers of Steam Engines, Boilers, Pumps and other Engineering specialties. Address

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care *The Iron Age*, New York.

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By Graduate of the University of Sevilla, Spain. Scientific, Electrical, Mechanical and Literary work. Correctness of work guaranteed. Moderate prices. Write for references.

J. DELGADO AGUILAR, B.A.

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## BOILER PLANT FOR SALE.

Here is the chance of your life.

The best boiler shop in the country, up to date in every respect. At present working with 50 hands; can turn out more work with 50 men than most shops with 100 men.

We are doing \$100,000 worth of business per year and making 20 per cent.

Have \$10,000.00 worth of orders on books most of the time.

Freight rate to New York City 13 cents, from the steel market 12 cents, from the tube market 5 cents.

For good reasons, this plant will be sold cheap.

Address "BOILER PLANT,"  
care *The Iron Age*, New York

## NOTICE.

Party owning factory site, land and buildings, desires some company making good paying specialty to locate on same with a view to taking an interest in the business. Address

LOCK BOX 572, New Castle, Pa.

## PARTNER WANTED.

A File and Rasp Maker of long and thorough experience, and with fair amount of capital, desires a partner or partners with equal amount to start a factory under exceptionally favorable conditions. Address

"FILE AND RASP," care *The Iron Age*, New York.

## WANTED.

The address of J. B. Maguire, a traveling salesman formerly with Taplin, Rice & Co., Akron, Ohio. Address C. C. FOUTS, Middletown, Ohio.

## WANTED.

100 ft. of cylinder boilers, 48 in. to 60 in. in diameter. Must be water tight. Address

"ROCK," care *The Iron Age*, New York.

## FOR SALE.

Combination Ice and Roller Skate Dies.

Patent for Elevator Stop and Lock.

Patent for Elevator Gate and Bar.

Send for our list of patents.

P. O. BOX 224, Boston, Mass.

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**Practical Hot Water Heating, Steam and Gas Fitting, Acetylene Gas**—How Generated—How Used, showing the latest and most approved devices and appliances used, the value of acetylene gas as an illuminant, discussed from various points of view, every class of generator described; gas burners and piping; also the best and quickest method of doing hot water heating, steam and gas fitting up to the present date. By J. J. LAWLER and GEO. T. HANCHETT. With tables, figures and folding plates. Revised edition. Illustrated. 8vo, cloth.....\$2.00

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Undisplayed Advertisements for Help Wanted not exceeding fifty words, including address, One Dollar each insertion. Additional words two cents each.

Original letters of reference should not be inclosed with replies to advertisements appearing in these columns, as they are frequently mistaid and lost. A copy of the reference will serve the purpose.

**CUTLERY SALESMEN**, experienced, first class, to represent manufacturer of a complete line of high grade shears, scissors, tinners' snips, on a commission basis; good opportunity for the right men; territories open in Southern, Central and Western States. Address, giving full information and references, to "W. F. L.," care *The Iron Age*, New York.

A competent **FOREMAN** for open hearth steel foundry; must be familiar with melt'ng and molding and all branches of the work; write age and experience in full, and recom-pense expected. Address "E. D. L.," care *The Iron Age*, New York.

A thoroughly competent young man to take charge of polishing and buffing department in brass factory manufacturing ornamental work; must be energetic, a good handler of men and capable of producing work at the lowest possible cost. Address, giving age, past experience, &c., "Brass Goods," care *The Iron Age*, New York.

Experienced **SUPERINTENDENT** for fan motor factory; must be expert mechanic and good handler of men; state experience, salary desired and give reference. Address "English Factory," care *The Iron Age*, New York.

First-class **MECHANICAL DRAFTSMEN** wanted by an Eastern engineering firm; state age, experience and salary. Address "Engineering Firm," care *The Iron Age*, New York.

Wanted at once, two or three **DRAFTSMEN** on shop details of structural and ornamental iron work. Address Boston Steel & Iron Company, Medford, Mass.

**MASTER MECHANIC**, acquainted with rolling mill and hammer machinery. Address "Mechanic," care *The Iron Age*, Hamilton Building, Pittsburgh, Pa.

**PIG IRON SALESMAN**; one acquainted with the Western trade preferred; give reference. Address P. O. Box 177, Pittsburgh, Pa.

**FOREMAN** for jobbing machinery work; must be a thoroughly practical molder on light and heavy castings, and be able to handle 15 to 25 molders. Address "Mechanic," care *The Iron Age*, 1205 Fisher Building, Chicago, Ill.

**PATTERN SHOP FOREMAN** for large machine shop in New England; an up to date man, of good habits, familiar with heavy work, gearing and general transmission machinery. Address, giving age, experience and salary expected, "Hood," Box 823, care *The Iron Age*, New York.

**SUPERINTENDENT** for rolling mill; one acquainted with high grade steels. Address "W. S.," care *The Iron Age*, Hamilton Building, Pittsburgh, Pa.

A first-class **BARRITT METAL SALESMAN** to cover the Eastern States; in writing give experience and references. Address Markle Lead Works, 720 Rialto Building, St. Louis, Mo.

Experienced **HARDWARE SALESMAN** or **CUTLERY SALESMAN** to take a side line of miscellaneous cutlery, butcher, putty, and kitchen knives, &c. Address "Big Cut," care *The Iron Age*, New York.

Liberal inducements to **SALESMEN** to sell mechanical goods to dealers and manufacturers in New England, New Jersey, Maryland, Virginia and Delaware. Address "Liberal," care *The Iron Age*, New York.

Thoroughly practical, experienced **SUPERINTENDENT**; also workmen for manufacturing forks, rakes, hoes, picks, sledges, wedges, forgings; state past employment, experience, age, salary. "M. J. T.," care *The Iron Age*, The Cuyahoga, Cleveland, Ohio.

**THEODORE THOMAS,**

Manufacturers' Agent,

11 Broadway,  
New York City.

CORRESPONDENCE SOLICITED.

**PATTERNS**

THE BALKWILL PATTERN WORKS,

970-972 Hamilton St., CLEVELAND, O.

WE MAKE A SPECIALTY OF RUSH WORK.

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Undisplayed Advertisements for Situations Wanted not exceeding twenty-five words, including address. Fifty cents each insertion. Additional words two cents each.

A position as **MANAGER** of a hardware store by a thorough hardwareman with several years' experience; the best of references furnished. Address "V. R. L.," care *The Iron Age*, New York.

As **SUPERINTENDENT** or **FOREMAN** of a foundry in need of a go ahead, intelligent man; all around experience on medium and light work, mixing of iron, press work, cored work, &c.; successful in handling men; New England preferred. Address J. C. Dyer, 329 Friendship street, Providence, R. I.

By **METALLURGIST** and **CHEMIST** in steel works or foundry, either gray or malleable; some business experience also; highest references. Address "Polytechnic," care *The Iron Age*, New York.

**ROLLER** of 18 years' experience on all kinds of general work, iron or steel, any size guide mill, will be open for engagement in about one week; also capable of superintending rolling mill on economical scale; have been at present position (running two trains) over seven years; best of references furnished. Address "Roller, No. 920," care *The Iron Age*, New York.

As **MILL MANAGER** in mill making bar and guide iron from scrap or muck iron; can mix pig and handle puddle mill; would take charge of forge department if chance for promotion; best of reference. Address "Mill Manager," care *The Iron Age*, New York.

As **CRUCIBLE STEEL MIXER**, one who has had charge of one of the best plants in the country; has had 20 years' experience and can furnish A1 reference. Address "Crucible," care *The Iron Age*, Hamilton Building, Pittsburgh, Pa.

**CHEMICAL ENGINEER**, graduate of this year's class at Massachusetts Institute of Technology, wants position to do analytical work on brass, bearing metal or steel; qualified to make strength tests, study of heat treatment and microscopical examination of metals and alloys. Address Harrison Everett Ashley, 947 Acushnet avenue, New Bedford, Mass.

A young man of ability desires a position as **ASSISTANT CHEMIST**; has had two years' practical laboratory experience. Address "G. W. R.," Drawer 30, Station W, Brooklyn, N. Y.

**EXPERT SALESMAN** seeks position; middle age; A1 character and education; acquainted with machine tools, &c., steam engines, boilers, &c.; ready to travel; accustomed to large business. Address "Batchelor," 109 East Nineteenth street, New York.

An experienced engineer, college graduate, 33 years old, desires a **SELLING AGENCY** or position as **LOCAL AGENT** in New York City for a manufacturing concern of high standing; compensation in commissions or salary; highest references. Address "Graduate," care *The Iron Age*, New York.

**SUPERINTENDENT**, practical experience designing, laying out plans, starting and operating new works, inventive and executive abilities, desires a change. Address "Stamping," care *The Iron Age*, New York.

As **REPRESENTATIVE** or **MANAGER** Pittsburgh agency for firm selling iron, steel, brick or similar products; well posted in use of above and acquainted with Pittsburgh trade; technical education and 15 years' experience in the iron business as salesman and superintendent. Address "B. B.," care *The Iron Age*, New York.

Experienced **TRAVELING SALESMAN**, aged 32, married, desires immediate engagement; highest credentials. Address "Salesman," care *The Iron Age*, 117-119 South Fourth street, Philadelphia, Pa.

Have had 24 years in hardware; 18 with jobbers, past six with leading manufacturer of locks, &c.; can fill any position and desire one where conscientious effort will be appreciated; best references furnished. Address "A. R. T.," care *The Iron Age*, New York.

A manager of ten years' experience, manufacturing and selling engines and other machinery, will be open for a situation by October 1, either as **MANAGER OF WORKS** or **COMMERCIAL REPRESENTATIVE** in Eastern city, Philadelphia preferred. Address "Engineer," care *The Iron Age*, New York.

**RUSSIA**.—Agency for aluminum, aluminum wire, lead and other metals desired by thoroughly competent party. Address "Russia," care *The Iron Age*, New York.

By a **SALESMAN**, age 43; 27 years' experience in the gun business; best of references. Address "B. M., No. 913," care *The Iron Age*, New York.

**TRAVELER** representing well known factory desires a side line on salary or commission. Address "High Grade," care *The Iron Age*, New York.

As **TIMEKEEPER** and **COST CLERK** by young man with several years' experience; will furnish A1 references. Address "Timekeeper," care *The Iron Age*, New York.

**TRAVELING SALESMAN**, thoroughly acquainted with the jobbing and large retail trade of the United States and Canada, wants position with factory. Address "H. C.," Box 1, Middletown, N. Y.

**MECHANICAL ENGINEER**; 12 years' experience as draftsman, chief draftsman and as superintendent of construction on electrical, hydraulic and blast furnace machinery and power plants; good references. Address "M. E. M.," care *The Iron Age*, New York.

**OPEN HEARTH SUPERINTENDENT**; thorough melter of basic or acid steel and general man of long experience. Address "B. and A. Steel," care *The Iron Age*, New York.

Position as **SUPERINTENDENT** (or assistant); experienced in manufacturing bar and guide iron and steel, also agricultural shapes; references A1. Address "Superintendent," care *The Iron Age*, Hamilton Building, Pittsburgh, Pa.

**ROLL TURNER**, age 32, desires a situation in a first-class mill; an active, sober and reliable man. Address "Active," care *The Iron Age*, Hamilton Building, Pittsburgh, Pa.

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The Chicago Milwaukee and St. Paul Railway Company has all its territory districted in relation to resources, adaptability and advantages for manufacturing, and seeks to secure manufacturing plants and industries where the command of raw material, markets and surroundings will ensure their permanent success.

A number of new factories and industries have been induced to locate—largely through the instrumentality of this company—at points along its lines.

The trend of manufacturing is Westward. Confidential inquiries are treated as such. The information furnished a particular industry is reliable.

A dress

**LUIS JACKSON,**

Industrial Commissioner, C., M. & St. P. Ry.,  
560 Old Colony Building, Chicago, Ill.

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For Iron and Brass Castings. Various styles and sizes. For Machines, Bridges, Tablets, etc. Leather and Wood Fillets.

Beekman Bldg., 103 Beekman St., New York.

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WOOD AND METAL,  
of Every Description.

SEND FOR ESTIMATES.

Mt. Vernon Pattern & Model Works,  
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## AMERICAN RAILWAY SUPPLY COMPANY.

Manufacturers of  
**BAGGAGE, HOTEL AND FACTORY TIME CHECKS, METAL FIGURES AND LETTERS AND EVERYTHING IN THE LINE OF STAMPED METAL WORK.**  
24 PARK PLACE, NEW YORK.

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WHEN YOU WANT GOOD ONES, ORDER FROM  
BRIGHT'S "OLD RELIABLE"  
**ST. LOUIS ELECTROTYPE FOUNDRY**  
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CAPITAL \$100,000.00.

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NEW YORK.

FIFTH FLOOR, MATTHEWS BLDG.,

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## Requests Your Attention to the Following:

### A SPLENDID ENDORSEMENT.

AMERICAN BICYCLE COMPANY,  
Park Row Building,  
221 Floor,  
President's Office.

NEW YORK, Jan. 2d, 1900.

The American Appraisal Co.,  
Milwaukee, Wis.:

Gentlemen—Some months ago I awarded you what I understand to be one of the largest contracts ever given in this country for the appraisal of manufacturing plants. It gives me pleasure to state that the work was performed by you in a wholly satisfactory manner, and with a rapidity and correctness in excess of my expectations.

I take pleasure in recommending you and your system of appraisal to manufacturers and property owners generally.

Yours very truly,

A. G. SPALDING.

NEW YORK, July 18, 1900.

Dic. by Mr. T. S. H.

The American Appraisal Co.,  
Milwaukee, Wis.:

Gentlemen—Your letter of the 9th inst. at hand, and in response to your request we enclose check for \$1,000 on account.

In regard to the appraisal of the different plants, we find same very satisfactory. These were taken solely for insurance purposes, and since that time we have had two fires, and the adjustments have been made upon that appraisal of the property, facilitating the trouble and labor of arriving at same, and in adjusting the loss, in these two cases to the satisfaction of both insurer and insured.

Yours very truly,

AMERICAN HIDE AND LEATHER CO.

THEODORE S. HAIGHT,

Third Vice-President.

The American Appraisal Co.,  
804 Park Row Bldg., New York City:

Gentlemen—We are in receipt of your communication of the 29th instant, and fail to understand why we should not be willing to give you a letter endorsing the very thorough manner in which you made an appraisal of our works at Paterson, N. J. It was so satisfactory that we have now, as you know, authorized you to do the same line of work for us at our branch works, Kent, O. The information therein contained (which is at all times available) is certainly of full value for the very reasonable charges you make for services rendered.

Yours truly,

KEARNEY &amp; FOOT CO.,

J. D. FOOT, Pt.

BOSTON, MASS., March 23, 1900.

The American Appraisal Co., Milwaukee, Wis.:

Gentlemen—Some time ago we wrote you expressing our entire satisfaction with the appraisal and inventory which you made of our different mill buildings, 1, 1999, and stating that we believed they would be of great value to us, especially in case of a fire. We have just had a rather serious fire in our Mill B, at Winchester, New Hampshire, and have had a practical demonstration of the truth of what we said then. The insurance adjusters have informed us that they have never had a claim for loss presented to them in as good shape as ours was, and we found that in making the settlement your inventory was of the greatest value. This was not only the case because it enabled us to satisfy the adjusters of the location and value of each piece of property, but, further, because it allowed us to make an adjustment entirely satisfactory to both sides without any delay. We were ready to take up the question of adjustment and were fully prepared for it within forty-eight hours after the fire occurred. This was an advantage which we had not before appreciated, but which must be evident to every manufacturer, inasmuch as the greatest loss and inconvenience from a fire frequently arises on account of the delay in being able to resume work. The entire adjustment was made in two days and we were able at once to proceed to repair damages.

We were mildly enthusiastic over your work before, but are vastly more so now.

Very truly yours,

THE NEW ENGLAND BOX CO.

H. H. LATHAM WOOD, President.

THE increasing demand during the past few years among manufacturers for a complete and itemized appraisal of their manufacturing plants, and showing the value of same, has been met by The American Appraisal Company. The Company after five years spent in perfecting a new and complete system of appraisal, and with capital and standing in the business world sufficient to give an absolute guarantee as to its work, offers its services to manufacturers throughout the United States. The appraisals furnished by this company include buildings, machinery, tools and miscellaneous articles of every kind whatsoever, composing and contained in the plant, all properly classified and arranged to correspond with actual conditions as they exist. Each and every item of material, labor, machinery, tools, miscellaneous articles, etc., is priced.

This record is corroborated by blue prints from original drawings made by the company's draughtsmen, showing elevations, cross-sections and floor plans of the buildings and location of all power-driven machinery, etc.

The appraisal when delivered is neatly printed and bound in leather in book form. It is a continuous record, as arrangement is made for additions and deductions to conform with changes or alterations in the plant.

In the distribution of insurance, the adjustment of losses through fire, for determining values for loans, mortgages, sales or consolidations, and for the infinite requirements of business necessitating a complete, correct and disinterested appraisal, this work is invaluable.

We should like to have every manufacturer in the United States send us a postal card requesting our pamphlet giving full particulars, etc.

### COMPARED WITH BOOKS.

PITTSBURGH, July 25, 1899.

The American Appraisal Co.,  
Milwaukee, Wis.:

Gentlemen—In reply to your favor of recent date asking us for a few lines in approval of your work, in making an invoice of our plant, we beg to say that a comparison of your figures with our books justifies us in giving you the approval asked for. We believe the work was carefully and conscientiously done and have accepted your figures as the basis of present value. Very truly yours,

STANDARD MFG. CO.,

Per O. J. Grant.

WATERBURY, CONN., U. S. A.,  
June 5, 1900.

The American Appraisal Co.,  
804 Park Row Bldg., New York City:

Gentlemen—Referring to your inquiry in the matter of the appraisal of our factory, we take pleasure in saying that it far exceeded our expectations.

It is highly satisfactory and done in a very thorough and comprehensive manner. We value it highly and commend your methods.

Yours very truly,

THE NEW ENGLAND WATCH CO.,

A. O. Jennings, Gen. Mgr.

BALTIMORE, June 1, 1900.

The American Appraisal Co.,  
New York:

Dear Sirs—Replying to your esteemed favor of the 29th ult., beg to say that we are only too pleased to add our testimonial to those of other houses for whom you have done similar work. We can say that for the first time we are actually in possession of facts, and had we known of your company, or a similar one, we would long ago have had such an appraisal made.

We are very much pleased with the details into which you went, and with the manner in which the work was executed.

Trusting that you will have the continued success which you deserve, we remain,

Yours truly,

WM. KNABE &amp; CO.,

J. C. H.

### A FIRE LOSS PROVED ITS VALUE.

MILWAUKEE, June 28, 1897.

American Appraisal Co., City:

Gentlemen—Replying to your request for an expression of opinion as to the merits of the work done by you for our Company in making an invoice and plans of our manufacturing plant, we beg to say that we are very much pleased with the work. We believe that it will be of the greatest value to us in case of loss by fire, as has been shown in a recent partial loss sustained by us. Your work is very complete both as to plans and inventory, and the amount of miscellaneous effects usually overlooked in a plant is much larger than we believe could ordinarily be proved without such an inventory.

We take great pleasure in recommending you to any manufacturer who is desirous of having such an invoice.

Yours very truly,

KIECKHEFER BROS. COMPANY.

Per F. KIECKHEFER, President.

POUGHKEEPSIE, N. Y., June 2, 1900.

The American Appraisal Co.,

804 Park Row Bldg., New York City:

Gentlemen—We have recently received your invoice, inventory and blue prints, covering a complete appraisal of the buildings, machinery and fixtures comprising our plant.

The work which you have done has involved a very great amount of figuring details and we are pleased to say that, so far as we have had time to examine the appraisal, it is satisfactory.

We were somewhat slow to decide to have the work done, but are so well pleased with the results you have given us that we would not hesitate to recommend any manufacturer operating a large plant to have such an appraisal made for his information. The complete inventory would be a protection in case of loss or damage by fire.

Very truly yours,

ADRIANCE, PLATT &amp; CO.,

By JOHN E. ADRIANCE, Vice Pres.



THE IRON AGE  
HAS BEEN AWARDED A  
GOLD MEDAL  
AT THE  
PARIS EXPOSITION, 1900

---

*SILVER MEDAL, PARIS, 1878*

*SILVER MEDAL, PARIS, 1889*

*HIGHEST AWARD, CHICAGO, 1893*

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Per lb., \$ .48

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Suitable for Heavy or  
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**MARKLE'S EUREKA BABBITT.**

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Metal for general use. Will  
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Special Metals Matched, and all kinds of Al-  
loys Made to order  
Full satisfaction guaranteed or money re-  
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Makers of Shot, Babbitt Metal Solder, Bar Lead,  
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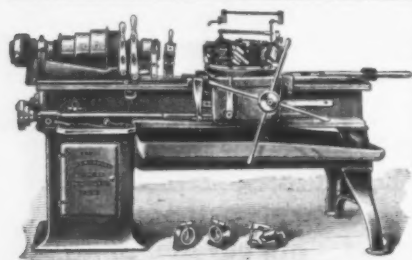


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SEE ADVERTISEMENT  
PAGE 6.

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Ingot, Sheets, Wire, Rods, Castings.  
Aluminum Wire and Cable (bare and insulated)  
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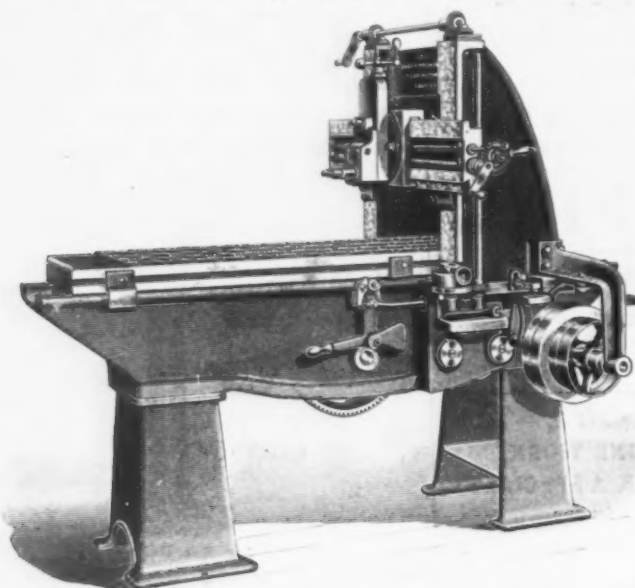
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## 16" x 16" x 4' Tool Room Planer.

We have recently re-designed our 16" x 16" x 4' planer in several important particulars with a view of presenting a machine that would meet the requirements of the most exacting of mechanics. No expense or pains have been spared to make this a machine that will plane perfectly true in every particular; each and every machine being brought to the degree of precision before it leaves our works.



It has a new departure in the way of feed mechanism. Very little power is required to drive this planer, as its feed mechanism is *frictionless*, and offers no resistance to the pull of the belts. Down feed is graduated to thousandths. This planer is finished in the same degree of excellence that is found on Hendey-Norton lathes and shapers. Net weight, 2,560 lbs. Send for catalogue.

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# THE IRON AGE

THURSDAY, SEPTEMBER 20, 1900

## Mammoth Lathe for Turning Granite Columns.

A remarkable piece of machinery, as shown by the several engravings and detail drawings, is the mammoth lathe for turning granite columns built by the

Cathedral of St. John the Divine, in New York City, which will have 32 granite columns, 54 feet long by 6 feet in diameter, and weighing when complete about 160 tons each. Innumerable columns of somewhat smaller dimension are also to be used in the construction, for the turning of which this lathe will be used. The lathe itself is 86 feet in length and weighs complete 135

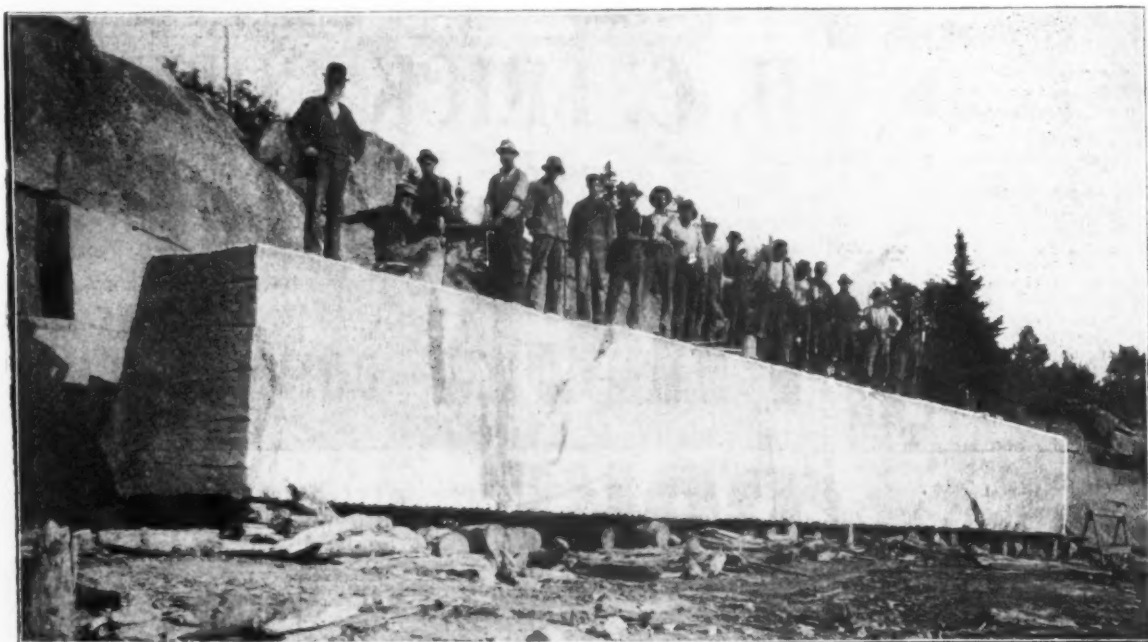


Fig. 1.—Block of Granite in the Quarry.

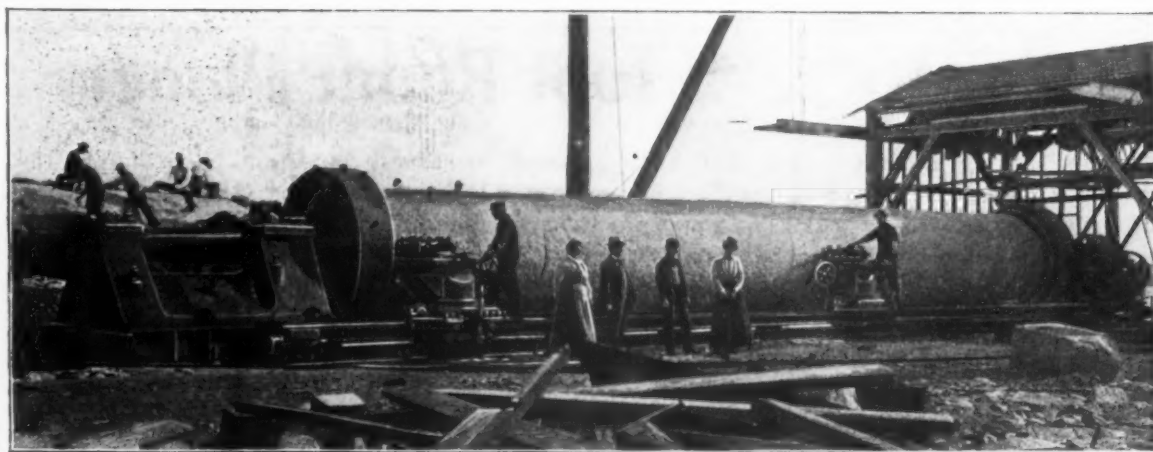


Fig. 2.—General View of Lathe.

### MAMMOTH LATHE FOR TURNING GRANITE COLUMNS.

Philadelphia Roll & Machine Company of Philadelphia, Pa., for use in the quarries of the Bodwell Granite Company, Vinalhaven, Maine. It was designed and patented by E. R. Cheney and H. A. Spiller of Boston, and is the only lathe of its size adapted to turning granite in practical use.

This machine was primarily conceived and constructed for the special work of turning up and polishing the granite columns to be used in the erection of the

tons, swings 6 feet 6 inches by 60 feet long, and has 8 cutters, each tool taking a cut 3 inches in depth, the whole eight reducing the column 24 inches in diameter at one pass over the length of the stone.

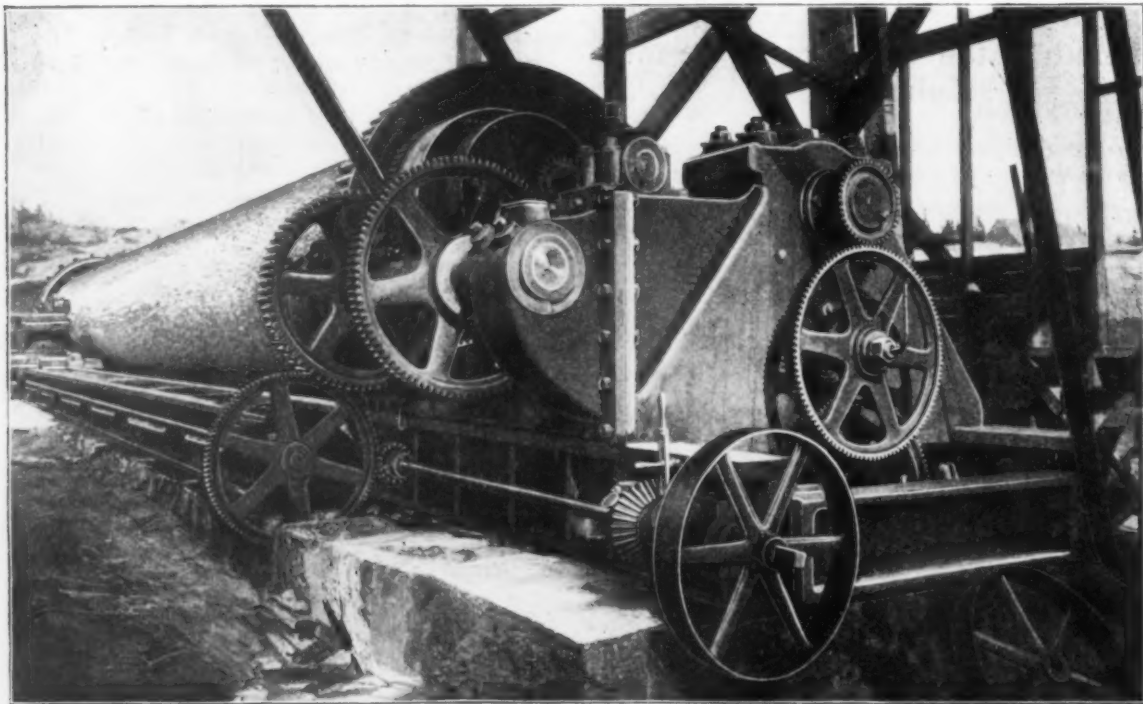
The piece of granite to be turned is cut square from the quarry, the one shown in the illustration, Fig. 1, being 67 feet long,  $8\frac{1}{2}$  feet by 7 feet in section, and weighs 310 tons. After dressing off the corners, which is roughly done by hand, the stone is placed on the

lathe, and a period of about six weeks is then required to dress and polish a column such as above mentioned.

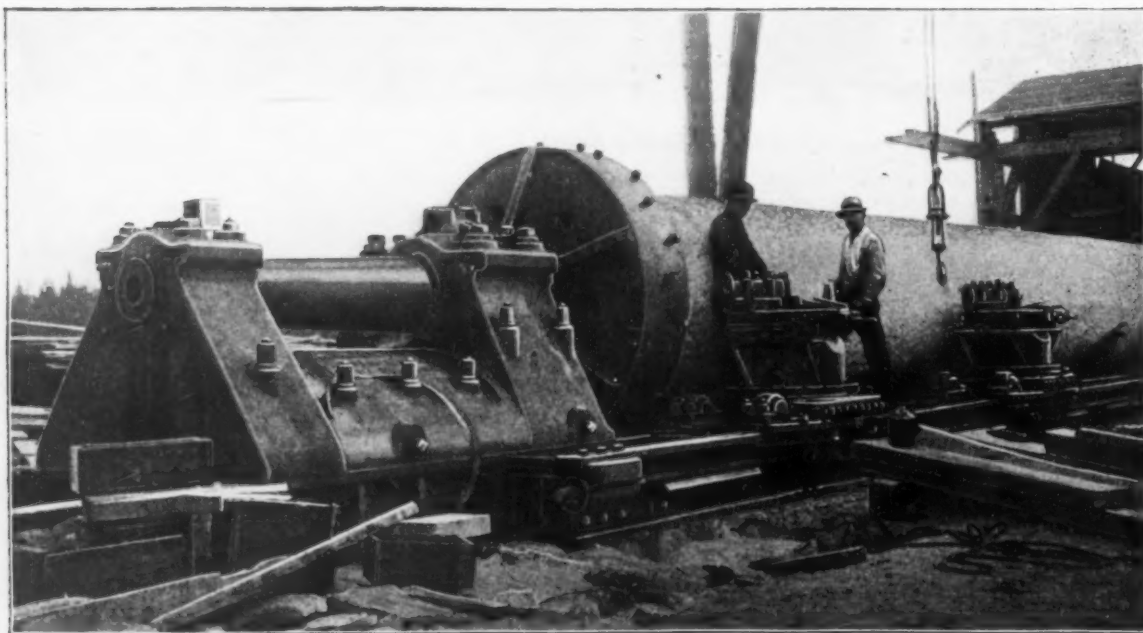
**Description of the Lathe.**

The bed of the lathe is made up of six pieces, three on a side, each piece being 21 feet 6 inches long, making the main part of the bed 64 feet 6 inches in length. The whole is bolted together by 12 stay bolts, 2 inches in

and run in babbitt metal bearings. The main bearings of the spindles are four feet in length and are of ball design, as shown in the drawings, they being so constructed in order to overcome the tendency of any thrust bearing on the end of the head and tail stock. The rear bearings of the spindles are 20 inches in length, and of the ordinary type.



*Fig. 3.—Head Stock End of Lathe.*



*Fig. 4.—Tail Stock End of Lathe.*

**MAMMOTH LATHE FOR TURNING GRANITE COLUMNS.**

diameter. The head and tail stocks are carried on extensions to the bed, each 10 feet 9 inches in length, giving the entire machine a total length of nearly 86 feet. The head and tail stocks are of cast iron, weighing 15 tons and 14 tons respectively, and are bolted down to the shears and anchors. The design of these is nearly the same, with the exception that the head stock, Figs. 6 to 9, has the bearings for gears bolted on. The spindles, Fig. 12, are hollow, 11 feet 10½ inches in length, weigh 9 tons each, and are cast of open hearth steel,

The gearing of this lathe is specially arranged, driving direct for fast or polishing speed, and by means of a back gearing a slow or cutting speed is obtained. Pulleys 30 and 36 inches in diameter are used and belted in the usual manner from countershaft.

The carriages are built upon a platen, which carries the feed screw nut and clutch. The weight of the carriage is carried on four friction rollers, these lifting the platen off the shears by 2-100 inch. The feed screws, one on either side, are 4 inches in diameter, and have a

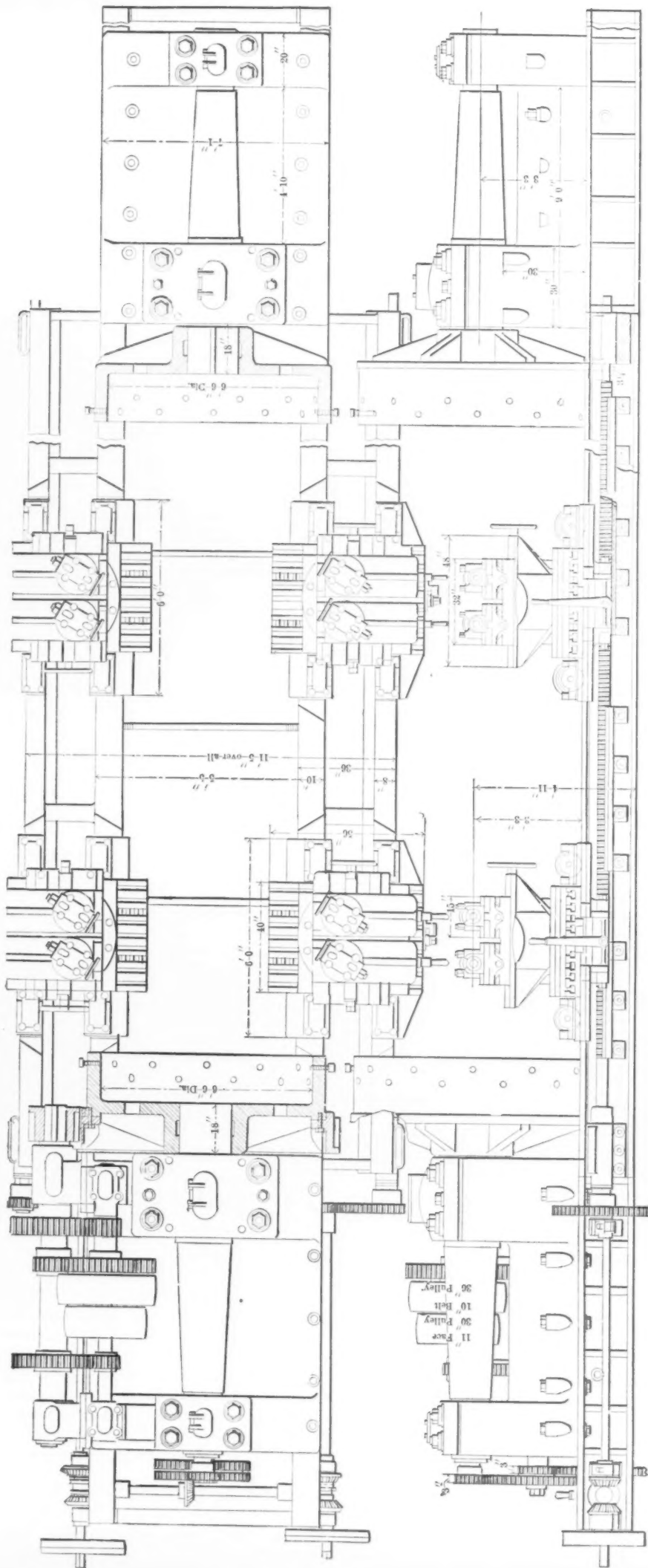


Fig. 5.—Plan and Side Elevation.

MAMMOTH GRANITE COLUMN CUTTING LATHE.



total length of 66 feet  $3\frac{1}{2}$  inches; they are forged in one piece and threaded for a distance of 58 feet 6 inches. On the platen is mounted a revolving table, which is fitted on its upper side with a slide which carries the lengthwise slide, this being operated by a feed screw and wheel, and has a traverse of 18 inches. This lengthwise slide has mounted upon it two tool posts, Fig. 5, each being equipped with feed screws operating at right angles to the feed screw of the lengthwise slide, and so permitting the use of each tool post independent of the other. The bearings of the tool post, Fig. 13, allow of a horizontal rotary movement, being bolted to the carrying plate by four bolts, which can be loosened and

final or high polishing is done by the same method, sand and powdered emery, &c., being used in the operation.

The chucks holding the stone in position are castings of open hearth steel. The head chuck is 6 feet 5 inches in diameter and weighs 16 tons. This has bolted to it the pad for the head stock. The tail chuck is of the same design except the gear pad; it is, however, reinforced by heavy ribs and weighs about the same as the head chuck. The stone to be turned is not held by the center, but the chucks are designed to take in 18 inches of the full diameter of the stone, which is then held in position by means of 24 set screws, which can be adjusted to hold stone of any diameter by means of suitable

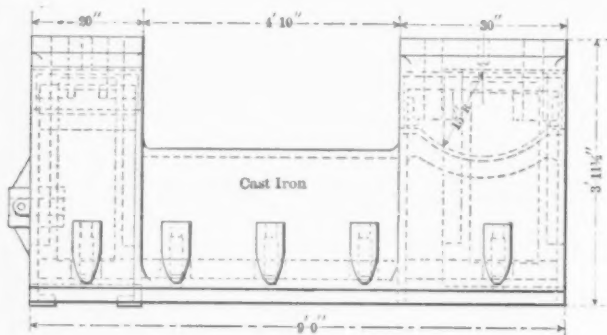


Fig. 6.

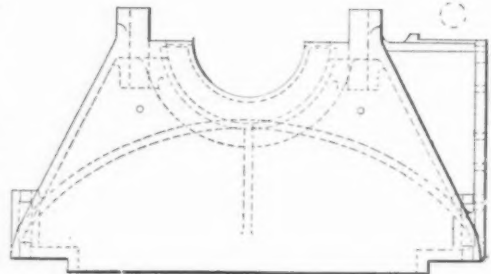


Fig. 7.

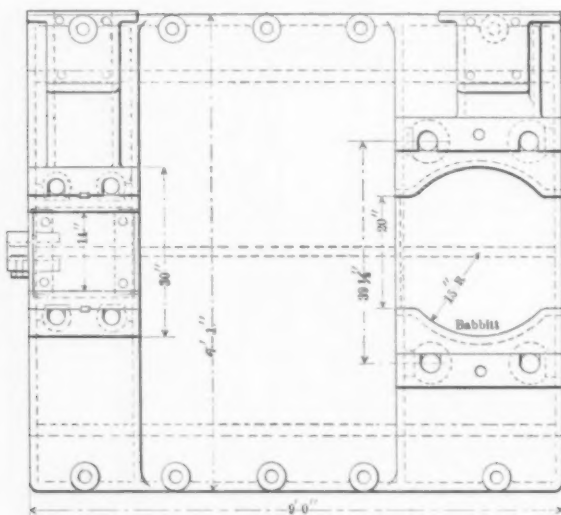


Fig. 8.

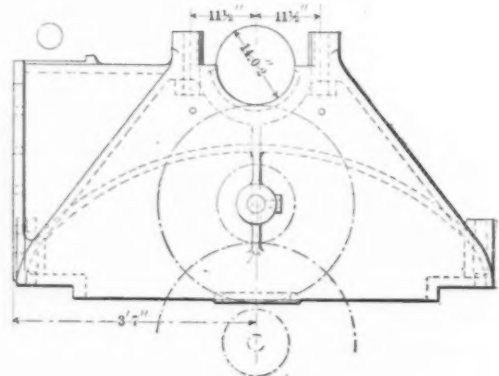


Fig. 9.

Details of Head Stock.

#### MAMMOTH LATHE FOR TURNING GRANITE COLUMNS.

the angle of the tool changed at will. The tool post carries in a cylindrical bearing a sleeve and mandrel which holds the cutting tool. The tool itself is a circular disk of steel  $\frac{3}{4}$  inch in thickness and 10 inches in diameter, with a V-shaped cutting edge, and is wedged on the mandrel and held tightly by means of a lock nut at the rear end of the mandrel, as shown in Fig. 13. The tool in operation is set at an angle to the axis of the stone being dressed, and as the stone revolves it imparts a rotary motion to these cutting disks, which are pulled into the stone by means of the feed screw.

The cut taken by these disks or tools is in the nature of a splintering off, and a cut 3 inches deep is made with ease. At the completion of the cutting process there is attached to the tool posts, in the same manner as the cutting tools, a cup shaped device holding hardened steel shot, by which means the rough polishing is done. The

ble blocks which are furnished with the machine. The chucks are forced on the spindle (which tapers at the end), and held in position by suitable keys. The entire weight of the stone is carried by these chucks, no intermediate rests being provided. As the weight of a granite column in the rough is in the neighborhood of 300 tons, it can readily be seen that this is a remarkable test of material and construction. This monster lathe is driven by a 50 horse-power engine, and when running at cutting speed makes  $1\frac{1}{4}$  revolutions per minute and at polishing speed 3 revolutions per minute are made. The accurate adjustment of this machine is shown by noting that it runs free for nearly  $\frac{1}{4}$  minute after the belt is thrown off.

The construction of this lathe was begun in December, 1899, and delivery made in May, 1900. It was in successful operation early in August last.

### The Production of Abrasives.

WASHINGTON, D. C., September 18, 1900.—The annual report of the United States Geological Survey in the United States, compiled by E. W. Parker, has been completed, and through the courtesy of the director the correspondent of *The Iron Age* is enabled to submit the following abstract:

The subjects considered under this heading are buhrstones, or millstones, corundum, emery, garnet, grindstones, pulpstone, infusorial earth, tripoli, oilstones and

used, but this trade is comparatively limited. The material from which the domestic millstone is made is a quartz conglomerate rock occurring along the eastern slope of the Alleghany Mountains. It is quarried in Ulster County, N. Y.; Lancaster County, Pa., and Montgomery County, Va. It was formerly produced in North Carolina, but no quarrying has been reported in that State for several years.

The total value of the millstone product of the United States has not exceeded \$30,000 in the last ten years. During the decade from 1880 to 1889, inclusive, the average value of the millstone product was over \$130,000 per year. In the decade from 1890 to 1899, inclusive, the average value of the product has been less than \$22,000 per year. Sympathizing with the general business revival in 1899, the industry, if such it may be called, gained about 8 per cent. over 1898, bringing the value of the product up to \$28,115, which, while not large in itself, represents the value of the best year's business since 1889.

#### Corundum and Emery.

A decrease in the production of corundum in North Carolina and an increase in the output of Chester County, Mass., and of emery in Westchester County, N. Y., with a general decrease in values, were the principal features of interest in this branch of the abrasive material industry in 1899, resulting as it did in an increase of 22 per cent. in the product and a decrease of 45 per cent. in the value. Corundum production in North Carolina decreased from 539 to 500 short tons; the production in Massachusetts increased about 25 per cent., and that of Westchester County from 1130 to 1400 tons. From this it appears that the entire production

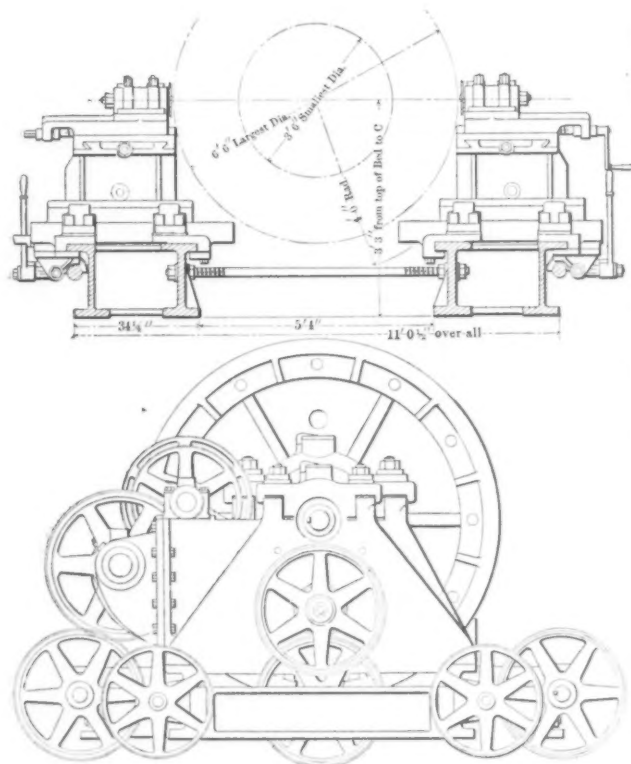


Fig. 10.—Cross Section.  
Fig. 11.—End View of Head Stock.

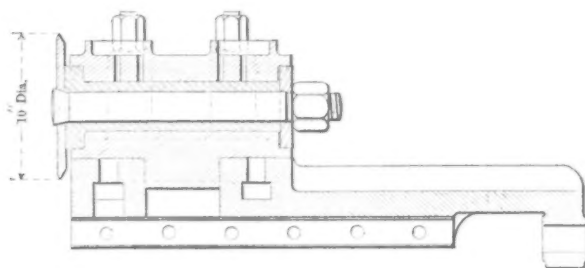


Fig. 13.—Tool Post.

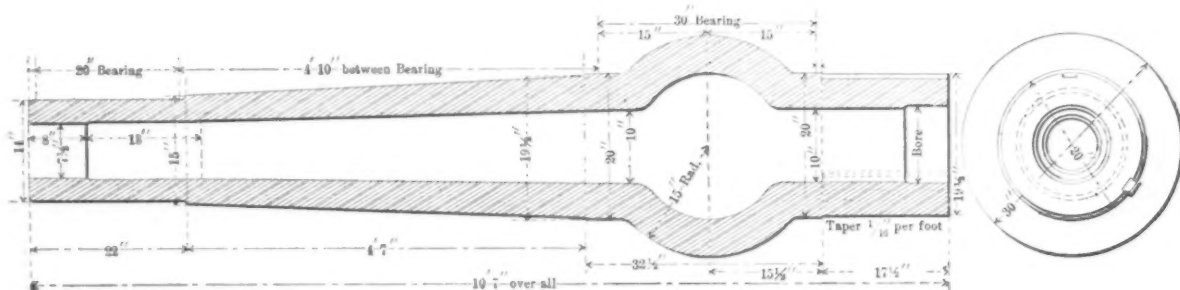


Fig. 12.—Section of Spindle.

### MAMMOTH LATHE FOR TURNING GRANITE COLUMNS.

whetstones and quartz used for abrasive purposes. The production of oilstones and whetstones includes scythe-stones, rubstones, &c. Carborundum and crushed steel, used as abrasives, being essentially manufactured articles, are not included in the mineral abrasives, but are treated in connection with this report.

The value of the output of these various articles in 1899, compared with 1898, was as follows: Buhrstones, 1898, \$25,934; 1899, \$28,115; corundum and emery, 1898, \$275,064; 1899, \$150,600; garnet, 1898, \$86,850; 1899, \$98,325; grindstones, 1898, \$489,769; 1899, \$675,586; infusorial earth, 1898, \$16,691; 1899, \$25,302; tripoli, 1898, none; 1899, \$11,730; oilstones and whetstones, 1898, \$180,486; 1899, \$208,283; quartz, 1898, \$23,990; 1899, \$39,000.

#### Buhrstones or Millstones.

Since the introduction of the roller process for making wheat flour the use of buhrstones has practically ceased. Millstones for grinding the coarser cereals, paint, ore, fertilizers, cement rock, &c., continue to be

was limited to the old, well-known localities. Discoveries of emery or corundum deposits have been reported in California, Colorado and New Mexico, but no output was obtained from them in 1899.

#### Garnet.

The varieties of garnet considered under this heading include those only which are used for abrasive purposes. The localities from which abrasive garnet is obtained are: Litchfield County, Conn.; Essex and Warren Counties, N. Y., and Delaware County, Pa. The Delaware County (Pa.) product is known commercially as garnet sand, to distinguish it from the larger crystals and massive garnet from the other localities. The quality of the material from the several localities varies considerably, the price ranging, according to quality, from \$20 to \$45 per ton at the mines. The production as reported to the Survey for 1899 amounted to 2765 short tons, valued at \$98,325, against 2967 short tons, worth \$86,850 in 1898.

### Grindstones.

Grindstones of domestic manufacture are obtained from the sandstone deposits which extend along the shores of Lake Erie for some distance east and west of Cleveland, Ohio, and as far inland as Marietta, and on Lake Huron above Detroit, Mich. In Mineral Resources for 1886 the methods of manufacture and use are given in detail, together with a tabular statement of the several varieties, foreign or domestic, that occur, with their special uses. Five varieties are produced in the United States—four in Ohio and one in Michigan. The four in Ohio are: 1, Berea, fine sharp grit, used especially for sharpening edge tools; 2, Amherst, soft loose grit, for edge tools and saws; 3, Independence, coarse sharp grit, for grinding springs and files and for dry grinding of castings; 4, Massillon, also coarse sharp grit, for large edge tools, springs, files and dry castings. The Huron (Michigan) stone has a fine sharp grit, and is used for sharpening edge tools when a very fine edge is required.

With the exception of 1882 the value of the grindstones produced in 1899 was the largest in the history of the grindstone industry. The statement of production in 1882 was based on "estimates" furnished by correspondents familiar with the industry. It is probable that such estimates were exaggerated, and that the record for maximum production belongs to 1899. There is no way of correcting the estimates for the earlier years, however, and last year must stand as second to 1899.

Compared with 1898 the value of the grindstones produced in 1899 exhibits an increase of \$185,817, or 38 per cent.

### Infusorial Earth.

The abrasives included under this head consist of those porous siliceous earths of organic origin known as tripoli, diatomaceous earth and infusorial earth. They are used to some extent in the manufacture of polishing powders and soaps, for which they are included among the abrasive materials. Their field is not limited to that use, however. Owing to the porous nature of infusorial earth it has been found to make an excellent absorbent for the manufacture of dynamite from nitroglycerin, and its nonconductivity to heat recommends it as a packing for boilers, steam pipes and safes. The production in 1899 was 3302 short tons, valued at \$25,302, an increase from 2733 short tons in 1898, valued at \$16,691.

### Tripoli.

Including the product from Newton County, Mo., which for want of a better name is called tripoli, the output amounted to 1032 short tons of crude earth. In addition to this 300 pounds of refined material was produced at Framingham, Mass. The total value of the product from all sources was \$11,730.

### Oilstones, Whetstones, &c.

The rough material from which our oilstones, &c., are made is obtained from various localities in the United States. The finer grades of oilstones are made from two grades of novaculite quarried in the vicinity of Hot Springs, Ark., and known, respectively, as "Arkansas" and "Washita" stone. Fine grained sandstone, called "Hindustan" or "Orange" stone, from Orange County, Ind.; Lake Superior stone, quarried in Cuyahoga County, Ohio, and a similar material, known as Labrador stone, from Cortland County, N. Y., and chocolate stone, from Lisbon, N. H., are used for whetstones. Seythstones and rubstones are made from Indian Pond and Lamolite stone, quarried in Grafton County, N. H., and Orleans County, Vt.; from Berea, Ohio, grit (which also furnishes grindstones), and from some of the Indiana sandstone.

The value of the oilstones and whetstones made in the United States was the maximum in our history. As compared with 1898, there was an accentuated value of \$27,797, or 15 per cent.

### Quartz Crystal.

The product of quartz crystal for wood finishing amounted in 1899 to 13,600 short tons, valued, crude, at \$39,000, against 8312 short tons, valued at \$23,990 in 1898, and 7500 short tons, worth \$22,500, in 1897.

### Crushed Steel.

The production of crushed steel by the Pittsburgh Crushed Steel Company in 1899 amounted to 675,000 pounds, valued at \$47,250, against 660,000 pounds, worth \$46,200 in 1898. The comparatively small increase in 1899 was due to the demoralized condition of the building trades during the greater part of the year, due to conflicts between the labor unions and the contractors. The bulk of the crushed steel sold is used in the stone cutting trade, particularly by the marble and granite cutters, although considerable quantities are used by lens workers and other glass grinders. For the latter

purpose the fine grades known as steel emery and rouge are used. The Pittsburgh Crushed Steel Company report that they have recently developed a trade with railroads and other machine shops who are using the material for throttle and other valve grinding.

### Carborundum.

The production of carborundum or carbide of silicon by the Carborundum Company, Niagara Falls, N. Y., in 1899, was 1,741,245 pounds, against 1,594,152 pounds in 1898. The value of the product in 1899 was \$139,000, against \$150,000 in 1898. The average price per pound in 1899 was 8 cents.

W. L. C.

### Trusts, Labor Unions and Arbitration.

The Industrial Commission, which resumed the taking of testimony in Washington last week, had before them as the first witness Labor Commissioner John McMackin of New York, who gave some interesting evidence regarding the relations between trusts and labor unions. In speaking of the development of the trusts Mr. McMackin said that, up to the present time, the growth of the labor unions had about kept pace with the growth of the trusts, so that when a controversy arose between them the unions had been able to hold their own and obtain fair terms. Thus they had not suffered from the growth of trusts and had, as a rule, maintained friendly relations with those combinations.

The chief danger, in the opinion of the Labor Commissioner, in the present industrial situation is that the success of the trusts in conducting business enterprises will lead to the popular belief that the concentration of all business enterprises under one general management is a good thing and that thus State socialism may creep in.

Regarding compulsory arbitration of industrial disputes, the witness said that it did not appeal to him as a good thing, unless the labor unions, which were parties to the arbitration, became incorporated, so that they could be held to the performance of any contract into which they entered on behalf of their members.

The present tendency of labor unions, Mr. McMackin said, was to incorporate. This statement, however, was questioned by members of the commission. Arbitration in New York, he continued, had not been found to be very satisfactory. Out of 455 strikes in the State last year the State Board of Arbitration had settled but 46. Labor unions were suspicious of legal boards of arbitration, he said. Nevertheless, he believed that compulsory arbitration was desirable where such semipublic utilities as telegraph and telephone companies and transportation lines were involved, and where the general public suffered acutely by an interruption of business.

### The Coal Consumption of the Turbine Destroyer "Viper."

The efficiency of the steam turbine motor for the propulsion of such craft as torpedo boat destroyers has been amply demonstrated first with the little "Turbinia," and more particularly by the "Viper," which has passed through her official steam trials under the direction of the British Admiralty officials with pronounced success in every respect, attaining on a three hours' trial the satisfactory speed of 33.838 knots. More could probably have been done, but this more than satisfied the contract conditions. The only point remaining to settle had reference to the economy of the steam turbine in comparison with the reciprocating engine; and the results are now available. As the power developed could not be determined the only measure for fair comparison is the consumption per hour for a given speed. On a three hours' trial at 31.118 knots the "Viper" burned 8.86 tons of coal per hour, or 19,846 pounds, and on a three hours' trial at 33.838 knots the consumption was 11 tons 9 hundredweight one-quarter 9 pounds, or 25,685 pounds per hour. The "Albatross," which was built and engined by Messrs. Thornycroft, is the only destroyer with reciprocating engines which has on official trials made a speed approaching to that of the "Viper," and here the speed was 31.552 knots, with the engines indicating 7732 indicated horse-power. The displacement of the "Albatross" is 384½ tons, and of the "Viper," 385 tons; while the coal consumed per hour for 31.552 knots for the former was 17,474 pounds per hour, and for 31.118 knots of the latter 19,846 pounds per hour, so that here is a fair basis of comparison which requires no comment. The 30-knot destroyers, with reciprocating engines, consume about 15,150 pounds per hour, this result being the mean of 45 boats.

It is officially announced that the Paris Exposition will close on Monday, November 5.



# Glimpses of the British Iron Industry.—III.

EDITORIAL CORRESPONDENCE.

## The Cleveland District.

There is something that is very impressive about the rows of blast furnaces which one sees in every direction in the Cleveland district. The blast furnace practice has so long been a standard that iron makers the world over are familiar with it. Now, however, modifications are being adopted at an increasing number of plants, which bring it more into harmony with the ideas of progressive American blast furnacemen. More powerful blowing engines are being introduced, and the system is being adopted to drive the furnaces individually. Aside from minor details there is very little in the methods in vogue likely to interest American managers.

Blast furnace wages are paid in the district on the basis of a sliding scale arrangement entered into in December, 1897, between the Cleveland Iron Masters' Association and the men. The former then included the Ayresome, Acklam, Bolckow Vaughan, Cargo Fleet, Clarence, Tees Bridge, Thornaby, Newport, Consett, Tees, Clay Lane, Red Car, Jarrow and Skinning Grove works.

The standard wages are paid when the net average selling price of No. 3 Cleveland pig iron has reached 34 shillings, but has not reached 34 shillings 2.40 pence. For every decline of 2.40 pence below 34 shillings down to 29 shillings there is deducted 0.25 per cent. from the standard; so that the total deduction from the standard at the minimum of the scale at 29 shillings is 6.25 per cent. From 34 shillings 2.40 pence to 35 shillings 2.40 pence there is an addition of 0.25 per cent. to the wages for every increase of 2.40 pence in the selling price. Then between 35 shillings and 39 shillings in the selling price the additions to the standard wages increase 1.25 per cent. for each increment of 1 shilling in the price. Between 39 shillings and 43 shillings the increments in wages of 0.25 per cent. for each 2.40 pence advance in price again rule, thus making the rate, with iron 43 shillings, 13.75 per cent. above the standard. From that point on only advances of full shillings are taken into consideration, the additions being 1.25 per cent. per shilling. At 60 shillings price the addition is 35 per cent. to wages. During the current quarter the blast furnacemen's wages are 45.50 per cent. above the standard. The selling price is ascertained by certified accountants, one chosen by the ironmasters, the other by the men, and with them may be associated any accountant approved by the North Eastern Railway Company. The price is ascertained from the books of Bolckow, Vaughan & Co., Limited; Bell Brothers, Limited; Cochrane & Co., Limited; Cargo-Fleet Iron Company, Limited; Wilsons, Pease & Co.; Sir B. Samuelson & Co., Limited, and Edward Williams. The minimum rate of wages for any workman employed to take blast furnace shifts is 3 shillings per day.

As for the crews, the following is of interest as showing the number of men employed at two furnaces making about 700 tons per week each:

Occupation.	Number of men.	Occupation.	Number of men.
Keepers .....	6	Cleaning boilers.....	2
Chargers .....	6	Braking steam hoist.....	3
Slaggers .....	6	Gantry hoist.....	1
Helpers .....	6	Driving slag tip crane.....	3
Attending stoves.....	3	Plate layers.....	4
Weighing charges.....	3	Driving metal loco.....	2
Loading furnace hoist, mine, limestone and coke fillers.....	21	Firing metal loco.....	1
Damping bells.....	3	Driving slag loco.....	3
Scarmen at kilns.....	3	Firing slag loco.....	3
Burning mine.....	1	Furnace fitter.....	1
Dropman .....	1	Fitters .....	3
Tipping material.....	5	Apprentice .....	1
Truckman .....	1	Fitters' laborers.....	4
Slag tippers.....	3	Tacklemen .....	5
Slag strippers.....	3	Smiths .....	3
Filling damping.....	1	Strikers .....	5
Scrappers .....	3	Bricklayer .....	1
Furnace laborers.....	24	Bricklayer's laborer.....	1
Cleaning roads.....	2	Mineral weighman.....	1
Metal carriers.....	10	Metal weighman and store-keeper .....	1
Sampler .....	1	Assisting weighman (boy).....	1
Blast enginemmen.....	3	Furnace foreman.....	1
Donkey pumps.....	2	Engineering foreman.....	1
Attending boilers.....	3	Total.....	174
2 furnaces working = 87 men per furnace.			

Under normal conditions the cost of labor per ton of pig iron is about 2 shillings 6 pence.

Of course, in the matter of cost of producing pig the question of the system of bookkeeping adopted plays its part. So far as our inquiry is concerned, which deals with the capacity of a district to live under stress of fierce competition, it must deal with extreme figures. It would be misleading to put down raw materials at the market prices which outsiders must pay, often to rivals

who have the advantage of controlling ore or coke or both. We must accept as a basis those plants who own iron mines, collieries and coke ovens and enter their raw material at cost, with a modest amount added for exhaustion of property. With raw ore at 3.5 shillings, coke at 9 shillings (a consumption of 21.50 hundred-weight per ton), limestone at 5 shillings per ton, labor at 2½ shillings, and incidentals and supplies at 1 shilling, we reach a total cost of 28 shillings, or say, roughly, \$7, at plants within stone's throw of large ocean going vessels. To what extent this will be lowered still by the introduction of by-product coke ovens is an open question, but it is certain that, if crowded, the Middlesbrough district can reach a cost of \$7 per ton, a figure little less than that at which Middlesbrough pig iron has sold in the past.

We do not pretend to state that even a majority of producers could reach such a figure, nor that any could keep it up for a long time without bleeding to death, but a number of the furnace companies in the Cleveland district can, under normal conditions as to labor, sell iron for a considerable period for that price.

If that be true, then some of our producing districts, not excluding the most favorably located, do not possess extraordinary advantages. "Spread eagles" in industrial matters is likely to cost too dearly to be encouraged, and it is far better that the cold facts be known that cheap iron is made elsewhere outside of the Lower Lake district, Pittsburgh, the Ohio Valley, or Alabama, and that the Cleveland district must be numbered, with others in England, and with the Minette district on the Continent, as a leading competitive locality, in the world's open markets.

The Cleveland district and the rolling mills and steel works of the Newcastle section make a very great variety of products. Conspicuous among them are rails, plates, structural material, wire and bars. In fact, some of the great companies build ships, supplying the greater part of the material, from the ore up.

Metallurgically the Cleveland district possesses great interest. The acid Bessemer process has flourished for many years, being based on imported ores. It is a well-known fact that acid Bessemer steel rails have been made at less than \$17 per ton when ore and labor were low; thus proving that dependence upon foreign material is not dangerous. In fact, a study of the position of littoral plants on the Continent of Europe, which have become rather numerous in recent years, will show that theirs is hardly as favorable, because the majority of them must rely upon back country fuel. In that respect the Cleveland district shows with South Wales a very important advantage.

The greatest interest, however, attaches to the efforts made in the Cleveland district to turn the local ores to account for steel making and thus secure independence of the fluctuations in the world's market prices for ore, upon which Wales, Scotland, Germany, France and Belgium must draw. Both Bolckow, Vaughan & Co., Limited, and the North Eastern Steel Company, Limited, have for many years been producers of basic Bessemer steel, but they have been forced to produce for that purpose what is really a special pig. The local ironstone by itself is not suitable for making basic Bessemer pig. It contains too much silica, too little manganese and too little phosphorus. The silica, of course, can only be combated by a heavy lime burden, and that, of course, means an increase in the coke consumption. The necessary manganese is obtained by using cheap manganese ores from Greece, and in some cases drawn from India. The "phosphorus hunger," however, has been the most serious matter, as it is in nearly all countries where basic Bessemer is made. Until now the Cleveland basic steel works have been able to cover their requirements by purchasing puddlers' tap cinder; but with the approaching exhaustion of this source of supply the cost has advanced, and the steel makers are now facing the necessity of putting back into their blast furnaces a certain portion of the basic slag produced by the converters, so as to be sure that the slag made is rich enough in phosphoric acid to command a ready sale.

The situation of the basic Bessemer producers of Europe generally suggests that there may be a field for the manufacture of a special high phosphorus pig in this country for export. Some years since a trial shipment was made of Southern Iron guaranteed to carry over 5 per cent. of phosphorus. At the time the idea was put forward to utilize the Tennessee phosphates as a source of phosphorus. We have never learned, however, whether or not the plan was carried out, and if so, what success followed.

With a similar end in view there was exported, some years since, to Germany a shipment of high phosphorus ore from the Lake Champlain district, but that, too, was never repeated.

In the meantime, however, the scarcity of phosphorus material has increased, and it seems a matter worth looking into whether in some form or other some advantage

may not be drawn from the situation by ore or iron producers in this country.

Of course the necessity for adding to the burden manganiferous and phosphoric materials adds to the cost, so that the basic Bessemer steel makers of the Cleveland district must count upon a higher priced raw material than the ordinary Cleveland pig. We understand that at one time the extra cost amounted to 2 shillings 6 pence and 3 shillings, but that now it has increased to 4 shillings and 6 shillings per ton. Of course, as an offset to this there is the profit on marketing the basic slag produced by the converters for fertilizing purposes, but the increase in cost is a serious feature, nevertheless.

The one fact which, however, has done more to limit the development of the basic Bessemer process in the district is that Lloyd's decline to accept basic Bessemer steel as a material for shipbuilding, the largest single consuming interest in the district. The result has been that the works have confined themselves to the manufacture of steel rails and track material and to the production of billets for wire, &c. We understand, however, that the North Eastern Steel Company are to go into the manufacture of beams.

Lately, however, the utilization of the local raw material has entered into a new phase, which has many interesting features economically and technically. It is the famous Clarence Iron Works of Bell Brothers, Limited, which has undertaken to solve the problem how to produce from the ordinary Cleveland pig, basic open hearth steel suitable for all requirements, the firm being closely associated with Dorman, Long & Co. of Middlesbrough, the pioneers in beam rolling in England and the owners of large rolling mills. A very handsome open hearth steel plant is in course of erection, which is ultimately to consist of 16 stationary open hearth furnaces, while the foundations have been begun for a very large rolling mill, all located close to the two groups of blast furnaces at Clarence.

The difficulties which beset the basic open hearth steel maker in the Cleveland district lie with the character of the pig iron, which is high both in silicon and in sulphur. The latter is met by the introduction of the Saniter process, which is being carried on with the co-operation of the inventor. The silicon, it is hoped, will be materially reduced by interposing a mixer between the blast furnaces and the open hearth steel plant. If that proves successful, then it is probable that a pretty high silicon iron, up to 2 per cent., would become available for the basic open hearth process. At present the average analysis of the iron used in the basic open hearth furnaces at the Clarence Works is: Silicon, 1.17 per cent.; sulphur, 0.218 per cent., and phosphorus about 1.50 per cent. With the employment of the Saniter process the steel carries 0.05 per cent. of sulphur and 0.05 per cent. of phosphorus. In looking over the records of the chemical laboratory the quality of the steel appears excellent. Some very elaborate physical tests of the steel have been made, and it is probable that Lloyd's will accept the material; so that the field of the shipbuilding industry is open to the basic open hearth steel.

The following are the quantities of material which are used at the Clarence Works per ton of steel, in hundredweights and decimals thereof:

	Cwts. per ton of steel.		Cwts. per ton of steel.
Clarence pig iron.....	12.24	Silico spiegel.....	0.02
Metal scrap.....	0.12	Oxide.....	0.75
W. I. and steel scrap.....	6.55	Limestone.....	2.55
Spiegel.....	0.17	Lime.....	0.43
Broken molds.....	1.18	Calcium chloride.....	0.12
Ferromanganese.....	0.09	Fluorspar.....	0.13
Ferrosilicon.....	0.02		

It will be observed that the quantities of chloride of calcium and of fluorspar which are used in the Saniter process are not large.

While it is yet somewhat premature to measure the full significance of the introduction of the basic open hearth process into the Cleveland district as a rival of the acid Bessemer and the basic Bessemer, yet it is difficult to escape the impression that it has a very promising future before it and will considerably strengthen the position of the district.

C. K.

The work of grading on the land which will be occupied by the Gruson Iron & Steel Works Company at Chester, Pa., is being pushed forward rapidly, and in a few weeks the buildings for the new industry will begin to loom in sight. The contracts for the structural work have all been completed, and bonds given for their completion by November 1, 1900.

During the last fiscal year the Chicago, Milwaukee & St. Paul Railroad spent \$1,383,296 on bridges.

## Bids for Navy Department Supplies.

WASHINGTON, D. C., September 11, 1900.—The Navy Department to-day opened bids for machine tools, supplies, &c., for the navy yards at Boston and Mare Island. The bidders and their proposals were as follows:

### Boston.

Bidder 3, Northern Engineering Works; 5, Hill, Clarke & Co.; 6, Safety Insulated Wire & Cable Company; 7, American Steel & Wire Company (Informal); 8, Page Bros. Company; 9, Industrial Works; 10, Manhattan Supply Company; 11, Manning, Maxwell & Moore; 12, F. H. Lovell & Co.; 13, Drew Machinery Agency; 14, Porter Company; 15, Jas. S. Barre & Co.; 16, John A. Roebling's Sons Company; 17, Ward & Huntington; 18, Simplex Electrical Company; 19, Niles Tool Works Company; 20, Browning Engineering Company; 21, R. C. Hoffman & Co.; 22, Carnegie Steel Company; 23, Bullock Electric Mfg. Company (Informal); 24, Western Electric Company; 25, Fairbanks Company; 26, Duke & Smith; 27, General Electric Company; 28, Swift, Jordan & Co.; 29, S. A. Woods Machine Company; 30, Thresher Electric Company; 31, Brown Holsting & Conveying Machine Company (Informal); 32, Barber & Ross; 33, Burnett Company; 34, Wheatley Bros.; 35, Crocker-Wheeler Company; 36, C. S. Knowles; 37, George McQuest Company.

Class 1. 20,700 feet 61-strand lead covered cable.—Bidder 6, \$10,714.25; 15, \$10,922; 16, \$12,681; 18, \$10,249; 24, \$12,965.10; 27, \$11,248; 28, \$11,303.78; 32, \$12,624.75; 33, \$11,180.

Class 4. One wood turning lathe.—Bidder 29, \$159.08.

Class 5. One automatic plug cutting machine.—Bidder 29, \$475.

Class 6. One 15-inch friction shaper.—Bidder 5, \$338; 11, \$315.

Class 7. One 21-inch upright drill with back gears.—Bidder 5, \$129; 11, \$121.75; 13, \$122.90; 19, \$108; 25, \$112.

Class 8. One improved quick acting jig or scroll saw.—Bidder 19, A \$68.50, B \$82; 29, \$77.

Class 9. One improved vertical mortiser and borer.—Bidder 19, \$181; 29, 172.

Class 10. One surface planer.—Bidder 29, A \$508, B \$883.

Class 11. One molding machine.—Bidder 19, \$472; 29, \$548.

Class 12. One combination boring machine.—Bidder 29, \$136.

Class 13. One locomotive crane of 10 tons, 20,000 pounds capacity.—Bidder 3, \$6475; 9, \$5980; 13, \$5965; 20, \$5555.

Class 14. One lot electric fixtures.—Bidder 14, \$626.45; 15, \$537.05; 17, \$590.28; 24, \$458.58; 33, \$464.05; 36, \$412.50.

Class 15. Lot electric fixtures.—Bidder 14, \$1015.45; 15, \$756; 24, \$562.23; 27, \$621.50; 33, \$628.

Class 16. Lot electric fixtures.—Bidder 8, \$130.50; 12, \$117.40; 17, \$149.20; 15, \$153.60; 24, \$135.60; 33, \$107.28.

Class 17. Lot steel angle bars.—Bidder 21, \$5632.02; 22, \$5363.51.

Class 18. Lot steel Z bars, 30 feet long.—Bidder 21, \$3,008.22; 22, \$4,266.36.

Class 19. Lot steel T-bulb deck beams, 50 feet long.—Bidder 21, \$5813.05; 22, \$5573.19.

Class 20. Four 32-kw. generating sets, vertical, cross compound.—Bidder 27, \$23,210; 30, \$23,080; 35, \$21,449.

### Mare Island.

Bidder 1, Pacific Tool & Supply Company; 2, Dietrick & Harvey Machinery Company; 3, Perry Ransom; 4, Arthur E. Rendel; 6, Garvin Machine Company; 7, Cuyler & Mohler; 8, Atlantic Works; 9, Drew Machinery Agency; 11, Manning, Maxwell & Moore; 12, Titum & Bowen; 13, Bement, Miles & Co.; 14, Henshaw, Buckley & Co.; 15, Niles Tool Works Company; 16, U. Baird Machinery Company; 17, Dunham, Carrigan & Hayden Company; 18, J. W. Cregar Mfg. Sales Agency.

Class 1. One steam hammer, 250 pounds.—Bidder 11, \$645; 13, \$615; 14 A \$625, B \$605; 16, \$573.50.

Class 2. One jewelers' lathe.—Bidder 18, \$114.50.

Class 3. One wet emery grinder, electrically driven.—Bidder 15, \$159.

Class 4. One center grinder, electrically driven.—Bidder 15, \$29.50; 18 A \$25, B \$40.

Class 5. One universal cutter and reamer grinder No. 3, complete.—Bidder 1, \$290; 6, \$195; 11, A \$283, B \$250; 15, \$310; 16, \$299; 18, \$268.

Class 6. One set reference disks, in case.—Bidder 1, \$65; 16, \$45; 18, \$42.50.

Class 7. Lot wrought iron pipe.—Bidder 7, \$1400; 17, \$981.56.

Class 9. 1600 square feet skylight, steel frame, and glass.—Bidder 4, \$880; 5, \$2000.

Class 10. One iron frame dimension planer.—Bidder 8, \$2066; 12, \$2096; 14, A \$2750, B \$1960.

Class 11. One lathe, tool room, 10-inch.—Bidder 1,



\$485; 14, A \$756, B \$656, C \$480; 15, \$660; 16, \$745; 18, \$598.

Class 12. One double head automatic bolt cutter.—Bidder 1, \$750; 2, \$661; 6, \$531; 11, \$600; 14, \$555; 15, \$645; 16, \$654; 18, \$630.

Class 13. Six drills, sensitive, 12-inch, electrically driven.—Bidder 1, \$1050; 15, A \$588, B \$732.

Class 14. Two lathes, tool room, 14-inch.—Bidder 6, \$818; 11, A \$866, B \$1050; 14, \$960; 18, \$904.

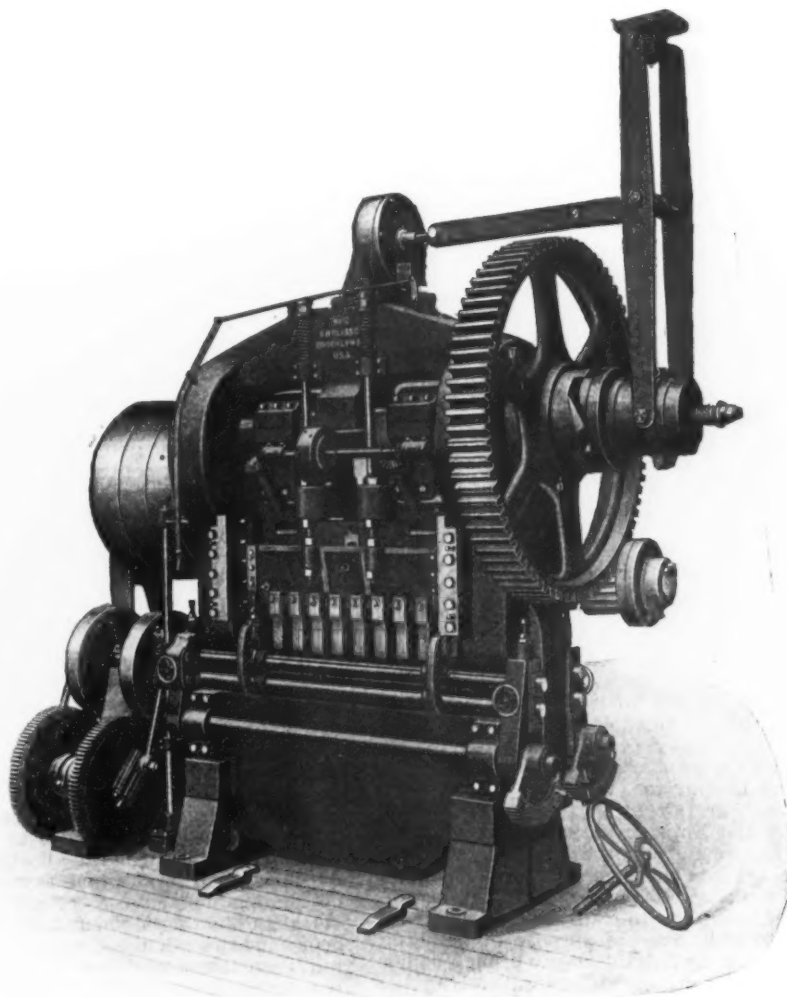
Class 15. One universal disk surface grinding machine, 18-inch.—Bidder 3, \$325; 6, \$345; 11, \$425; 12, \$294.50; 14, \$390; 16, \$380.

Class 16. Two shapers, motor driven, quick return stroke, 16-inch.—Bidder 11, \$1860; 14, \$1820; 15, \$2026; 16, \$1620.

Class 17. One open side iron planer, motor driven.—Bidder 2, \$8125; 14, A \$8100, B \$8498.

### The Bliss Perforating Press.

The accompanying illustration gives a good idea of a new perforating press with a cam actuated stripper and a double roll feed, the housings of which feed are so hinged that they may be readily lowered out of the way for changing dies or for repairing them, by using the pinion wrench in connection with the segment gears on the end of the roller frame. Milled steel collars on the feed shafts are employed to feed the plates, and adjustable yokes are supplied just outside the feed collars to prevent the springing of feed shafts when perforating narrow plates. The mechanism for operating the feed rolls is shown on the floor at the left side of the machine, and is so arranged that all parts requiring adjustment are easy of access. The mechanism is quite original in



THE BLISS PERFORATING PRESS.

Class 18. One 20-inch swing universal monitor lathe.—Bidder 9, \$971; 14, \$1120; 16, \$910; 18, \$999.

W. L. C.

A new pipe and tube mill is to be established at Chester, Pa. It will be known as the Keystone Tube Company and was chartered at Trenton, N. J., August 7. Although the officials are reticent as to the publication of the names of the stockholders, it has been learned that the three names of the incorporators are George M. Keasby, David L. Howell and William A. Calhoun, the latter of Newark, N. J. The capitalization of the company has been placed at \$80,000, and this amount can be increased any time when the company desires to do so. Where the plant will be located is a matter of speculation at this time, as the new firm have a number of sites under consideration. Joseph M. Bell of Chester, engineer, is preparing the plans for the new concern, which are to include, besides a pipe mill, a universal mill.

The entire number of pupils in all schools, public and private, in the United States last year was 16,687,643, out of an estimated population of 72,737,100.

design, and enables the rolls to feed an equal distance for two or three strokes, then vary the length of feed before making the next stroke. For instance, in a period of three strokes of the punch slide, the rolls may be fed two short and one long distance, or *vice versa*, or all three spacings may be alike. By substituting other cams and gears of small proportions a number of different combinations may be obtained, thus securing a considerable variety of spacing or grouping of the rows of holes.

In the machine illustrated the jaw clutch on the main shaft is thrown in and out of action by a lever connected with a steam cylinder on the top of the press frame, the action of which is controlled by a hand lever shown on the left side of the press. A different device for operating the jaw clutch or a different style of clutch may be employed, if desired.

The following dimensions will be of interest: Width between housings, 65 inches; maximum width of sheet that may be punched, 60 inches; punching capacity, 60 1/2-inch holes in 3/8-inch iron at each stroke of the press; length of feed at each stroke varying by 1-64, 0 to 6 inches; weight complete, as illustrated, 70,000 pounds. The casting of this press alone weighs something like 15 tons, and is claimed to be one of the largest castings ever turned out in Greater New York.



This machine has quite recently been completed by the E. W. Bliss Company, 11 Adams street, Brooklyn, N. Y.

## Canadian News.

### Canadian Canals in an American Export Steel Trade.

TORONTO, September 15, 1900.—The preparations being made by some of the steel companies in the United States to send cargoes in unbroken bulk from Lake Erie and Lake Michigan ports through to transatlantic points are receiving some attention in this country. If American steel manufacturers can ship their products to destinations beyond the Atlantic in vessels of such capacity that they can be passed loaded through the Welland and St. Lawrence River canals, then Ontario steel manufacturers ought to be able to do so, too. By such easy and cheap means of transportation to the oversea markets, the prospects of a steel industry in Ontario would be greatly expanded. New projects for steel works here would no longer be limited to the outlook of a purely home market. Hence the enterprises already introduced are not unlikely to be advanced by the discovery that small lake vessels can be utilized to carry economically the finished products of steel mills to Europe. Companies now exist, to nearly all of which guarantees of large local bonuses are voted, to manufacture iron and steel at Port Arthur, at Sault Ste. Marie, at Collingwood, at Owen Sound, at Welland, and at Kingston—all lake ports. Most of these companies propose to go into manufacturing on a large scale. At Midland, on Georgian Bay, there is a new furnace about ready to go into blast. The Hamilton Iron & Steel Company have now works of greatly increased capacity. These existing and projected iron and steel works had their prospects materially brightened by the discoveries of such large bodies of good ore in New Ontario as the Mattawin, the Atikokan and the Michipicoton deposits, to say nothing of those at Desbarats and other points.

In some quarters it is not considered good business policy to let the Americans use the canals without extra charge, to build up a through export trade in steel. Says the *Toronto Mail and Empire*, for example:

"It is not particularly to our advantage to help them in the race with the United Kingdom by affording them a highway that is practically free. From their small vessels there will be no transshipment at Canadian ports, no lighterage over Canadian railways, no warehousing at terminal points. Canadian labor will get no benefit from the traffic which thus flows down our great waterways, built at such a heavy cost, to displace British iron and steel, and to seize markets our own manufacturers at Sidney are looking to. We must exact such a toll as will yield us our fair proportion of the profits we help to earn by the transportation facilities we afford. It is due to our own growing iron and steel industries to tax the foreign iron and steel shipped as through traffic in unbroken bulk from Chicago, Cleveland, Lorain and other American lake ports to transatlantic countries. The canals were not built for the purpose of assisting the United States to cripple Britain in any branch of her foreign trade, or to give our neighbors any advantage over the rising manufacturers of Canada."

### Nickel Developments.

A large smelting plant is being built in the township of Denison by the Ludwig Mond interests. In fact, quite a mining center is growing up about the nucleus of the company's works at that point, which is now called Victoria Station. The company are also developing a nickel property in the township of Garson, 8 miles southeast of Sudbury. In addition to this, which is known as the Cryderman mine, three other large properties, recently purchased in the township of Sevoc by the same company, are being tested with a diamond drill.

The Nickel-Copper Company of Hamilton, who are coincident with the Nickel Steel Company of Hamilton, are also pushing developments in the ore fields. This company have a 50-ton smelting plant in course of erection at Worthington Station. The greater part of what is known as the north range has recently been purchased by the company. The efforts of the Nickel-Copper Company to establish refining works at Hamilton, from which in connection with the steel works there nickel steel would be produced, have received some attention in former letters. Dr. Hoepfner's scheme was first taken up, though when the works of the Hoepfner Refining Company were begun their purpose was the treatment of zinc ore. They were subsequently drawn into the project of the Nickel-Copper Company. When the construction of the works leased by the Nickel-Copper Company was about completed a storm injured the tall chimney. In the meantime friction had arisen between Dr. Hoepfner and his associates. The

cause of it was not made public, but the upshot was the beginning of several legal actions after Dr. Hoepfner's return from Europe, one of them being to have the Hoepfner Refining Company wound up. It now transpires that the Nickel-Copper Company were not satisfied with the Hoepfner process. H. C. Frasch, the company's metallurgist, now appears with a process, of which a public demonstration was recently given. Tanks contain a solution of common salt. At the bottom is the matte, pulverized, and lying on a bed of broken carbon, the two together forming the anode, and covered with a thin diaphragm of sand. The electrolyzing deposits the sodium on the cathode and liberates chloride at the anode. The sodium is transformed by the water into caustic soda and drawn off at the top. The chlorine at the bottom combines with the metals of the anode to form their respective chlorides. From these the metals are extracted by the ordinary electrolytic process.

### Manufacturing Developments at Shawinigan Falls.

At Shawinigan Falls, on the St. Maurice River, in Quebec, notable industrial developments are proceeding. The power company who are completing works for utilizing the great fall there to produce hydraulic and electric energy have already expended a large sum. Over 30,000 horse-power has already been contracted for by three big manufacturing concerns, who have also secured building sites. In fact, the works of the Pittsburgh Reduction Company there are far advanced toward completion. The Belgo-Canadian Pulp & Paper Company are also to establish works there. These are to be on a large scale. They will include a 100-ton ground pulp mill, a 75-ton sulphite fiber mill and a 100-ton paper mill. To run such a system of industries will require 15,000 horse-power. A. C. Rice of Worcester, Mass., is named as the company's engineer, who will place all contracts for the development of power, erection of buildings and the furnishing of machinery. It is said that the contract calls for the completion and equipment of these mills by June 1 next. At present the Shawinigan Water & Power Company are advertising in Nashua, Lowell, Fall River and other New England manufacturing towns, endeavoring to attract from these places the French Canadians now working there. Labor is scarce at Shawinigan. That seems to be one drawback to the progressive tendencies.

### Manganese Smelting Projected.

The Mineral Products Company, who have their headquarters at Moncton, N. B., are considering the question of establishing smelting works to handle the products of the manganese mines in the province. Manganese is a mineral found in New Brunswick in larger and more numerous deposits than in any other equal area of the North American continent. Hundreds of tons have been exported, most of it going to the United States. In Kings and Albert counties upward of \$100,000 has been expended within the last few years in exploiting and developing manganese properties. In this enterprise certain New York men took the lead. Efforts have been made to put the manganese in shape for shipping, but these have not been satisfactory, and it has been concluded that it will be more profitable to have it smelted near the mines. The question of establishing a smelter at St. John has been submitted to the Mayor. From 6 to 10 acres of land would be required by the company at a point convenient for rail and water shipment. It was represented to the Mayor that employment would be given to upward of 400 men. Halifax has been taking an interest in the proposal. It has advantages in the form of cheap coke.

### Michipicoton Business.

The Algoma Commercial Company are shipping weekly 4000 tons of iron ore from the Helen mine. The road from the mine to the harbor is gradually being equipped. As to its rolling stock, 75 of its 50-ton steel cars have been delivered from scows at the dock, and some of them are now in service, running on the 12-mile road to the mine. This road is being laid with 85-pound steel rails, and the work of ballasting is being proceeded with. At present all shipments from the mine are going to Midland to supply the Canada Iron Furnace Company's smelter there, but it is expected that large shipments will be made to Hamilton before the present season of navigation closes. Preparations are being made to install at the Helen mine the overhead conveyor system and the additional Gates crusher recently ordered. The new ore dock is to be extended by building hopper bins in the rear, and a large quantity of ore will be stored there during the coming winter. Storage will also be provided in front of the dock on the ground level, and from the stock ore will be loaded by steam shovel next spring. This mine will cause the output of Canada to be more than doubled next year. A contract has been let to the

Foley Brothers for the immediate extension of the Algoma Central Railway 100 miles north. The line from Michipicoton will be extended eastward to connect with this road, and the extension will pass several more ore bodies, among them being one called the Josephine mine. It is said to be a large deposit of red hard ore of good grade. The last of the four steel barges which were purchased by the company arrived from England some time ago.

#### Minor Notes.

The largest shipment of copper matte yet made from Texada, B. C., was sent to the United States last week.

The Calabogie Mining Company, in Eastern Ontario, have received an order to supply 10,000 tons of iron ore to the Midland smelter. The ore will be shipped by the Kingston & Pembroke Railway and Grand Trunk.

An official of the Department of Trade and Commerce left Ottawa on Thursday for the Trail and Nelson mining camps, where he is to audit the books of the smelting companies to determine the amount of their claims for bonus.

At last the concern who are to build the smelter at Kingston are incorporated. They are the Catarqui Mining & Development Company. Their capital stock is \$400,000. Senator Maclaren, James M. P. Maclaren, Senator Donald McMillan, Charles L. Meyer, and Edwin S. Leatham are the incorporators.

Canadian manufacturers of rivets, burrs and bolts have had to increase their discounts in order to meet United States competition. The increase is 10 per cent.

The documents transferring the property of the General Mining Association to the Nova Scotia Steel Company have been executed. It is understood that the cash consideration for the G. M. A. properties was \$1,500,000. Besides the coal areas the assets taken over include the mine equipments, real estate, buildings, machinery, &c. The erection of coke ovens at Sydney mines by the Nova Scotia Steel Company has commenced.

C. A. C. J.

#### Central Pennsylvania News.

HARRISBURG, PA., September 10, 1900.—“The outlook has improved greatly during the last 30 days,” said an official of the Pennsylvania Steel Company, “and the inquiries and increase of orders recently indicate a still further improvement of the iron and steel situation.” This official, whose connection with the corporation directing the operations at Steelton and Sparrow's Point brings him into touch with the trade throughout the Eastern district, is exceedingly hopeful, and, while not extravagantly optimistic, and admitting that the prices continue low, is nevertheless confident that a turn for the better has come.

The Pennsylvania Steel Works are busy in every department and several of the departments are crowded almost to the point of congestion, notably the bridge and construction and frog, switch and interlocking departments. Both of these departments will soon occupy new buildings on the land purchased a few months ago adjoining the present property of the company. The building of the frog, switch and signal department will be 3000 x 400 feet, with the most modern machinery, and the bridge and construction department will have a building, which, reduced to an average width of 75 feet, will be 3300 feet long. The new machine shop will be 300 feet long. With these additions and enlargements the company will be better able to keep pace with their growing business.

The Duncannon Iron Company have plenty of business, and, besides the bar mill, the nail factory is also in operation.

This week the Chesapeake Nail Works resumed operations after a shut down since July 1. The puddle mill has been on since last week. There has been some dissatisfaction in this district over the wages of puddlers, but no serious trouble yet. The prevailing rate for most of the year was \$4 a ton, but this has been reduced to \$3, and some of the men at the Harrisburg Rolling Mill went out last Monday. Most of them have returned to work and the management anticipate no further trouble. The puddlers at the Bailey mills have been notified that unless the situation improves within the next three weeks the rate will be \$3.50. The employees of the Reading Company at Danville have been notified of a cut to the \$3 rate.

The Harrisburg Pipe & Pipe Bending Company made some important changes in their new pipe mill which delayed the beginning of operations several weeks beyond the time originally fixed for the start. The outlook for this new mill is first class and the company feel greatly encouraged. They now expect to get into the plate making business before the month is much older.

The pipe bending department of the plant is having an unusual run of business for this season of the year.

The plant of the National Tube Company at Middletown is in operation to about 75 per cent. of its capacity.

It is stated that the 1200 employees of the American Iron & Steel Company at Lebanon, who went out on the reduction to the \$3 scale a month ago, will return to work for \$3.50.

The Lalace-Grosjean Tin Plate Works are being operated to their full capacity day and night. Superintendent Stanford says that he can easily dispose of the entire product of the mills for months to come.

“Prospects for future business are very good,” said President Wm. R. Fleming of the Harrisburg Foundry & Machine Works, when seen by *The Iron Age* representative. “Notwithstanding our present plant is almost double the capacity of the old one, it is taxed to the utmost, even though we are working day and night. Our Boston office has just reported an order for three engines, each of 600 horse-power, of our latest and most economical four-valve type. Very encouraging reports are received from all our branch offices located in New York, Philadelphia, Pittsburgh, New Orleans, Atlanta and Baltimore, stating that they have closed some contracts and have prospects of getting others. So that the business outlook for us is very good.” Regarding recent contracts Mr. Fleming said:

“We are just shipping the last engine on a contract of 1500 combined horse-power for the Curtis Publishing Company of Philadelphia. This engine is one of our latest types of four-valve Harrisburg standard self oiling engines.

“We have also just completed and made the last shipment to the Great Northern Paper Company of two out of ten 300 horse-power engines to go to their mills at Millinocket, Maine. We have just shipped one 600 horse-power four-valve tandem compound engine, arranged for direct connecting to a General Electric generator, to the Des Moines Edison Light Company, Des Moines, Iowa.

“We have just received word from one of our erecting engineers at the Charleston Consolidated Railway, Gas & Electric Company's plant, Charleston, S. C., that our plant, consisting of three tandem compound four-valve engines of 1000 combined horse-power, has been accepted and that the purchasers are very much pleased with the duty they are getting from the engines.

“We have recently received orders from the Cuban-American Sugar Company, New York, for 125 horse-power engines; an engine for a large new office building at Newburg, N. Y.; orders from the Tupelo Cotton Mill, Tupelo, Miss., and for the State Insane Asylum at Jackson, La. We have an order from the town of Alexandria, La., for an engine, this being the third order from them in the past few years.”

The Central Iron & Steel Company have closed some new contracts and General Manager McCauley is pleased with the outlook.

S.

#### Modern Fire Proof Construction.

Fire proof construction and the materials required for it are nowadays largely engaging the attention of builders and architects. The result is that many new private residences in New York City will be of the fire resisting type. In a recently built house of this class, described by *Fire and Water*, concrete arches between steel beams, with cinder concrete filling on top, compose the floors. In the bathrooms the concrete filling is covered with a water proof course of burlap and hot asphalt, flushed 6 inches high on all the walls and protected with a 2-inch layer of concrete, in which the floor tiles are laid. The water pipes are bricked in and covered with roofing slates, and over these has been lapped burlap swabbed with hot asphalt, covered with an upper layer of concrete. In this way the pipes are permanently inclosed, and a kind of trough is made, pitched to one end, so as to carry off leakage or waste water.

On Thursday, Friday and Saturday of week before last there was a convention of the heads of departments and traveling representatives of the Magnolia Metal Company. It was held in New York City at the Murray Hill Hotel. Twenty-five representatives of the company were present, including the manager of the Chicago, Pittsburgh, Boston, Philadelphia, San Francisco, Montreal and Atlanta branches. Papers were read by various of the members showing the adaptability of the metal in certain lines. There was general discussion regarding the uses of the metal in new industries. The business sessions were all in fact given up entirely for the instruction of the members by each other. On Thursday evening the party were entertained by roof garden theatricals. On Friday evening they were banqueted and Saturday afternoon brought the convention to a close with a trip to Manhattan Beach.



### Appraising Imported Machinery.

WASHINGTON, D. C., September 18, 1900.—The Treasury Department has modified the recent ruling, published in *The Iron Age*, concerning the appraisal of machinery after the same has been set up in running order at the place of final destination. In the instructions given to collectors it was required that the inspection of the appraising officer should be made within 30 days, but upon representations made by customs officials as well as by manufacturers this provision has been modified in the manner set forth in the following letter addressed to the collector at Boston:

"The Department is in receipt of your letter dated the 1st inst., concerning the extension of the period of time prescribed in the special form of bond embodied in Treasury Decision No. 22,463, dated August 29, 1900, within which written notice shall be given to the collector of customs at the port of importation after the issuance of the delivery permit that the machinery therein mentioned has been set up at the place of delivery or destination in order that the official examination and appraisal may be completed.

"You state that the period of 30 days provided in the form of bond set out in the decision above referred to is

operated continuously with the least expense, therefore giving a high return for the money invested in the apparatus.

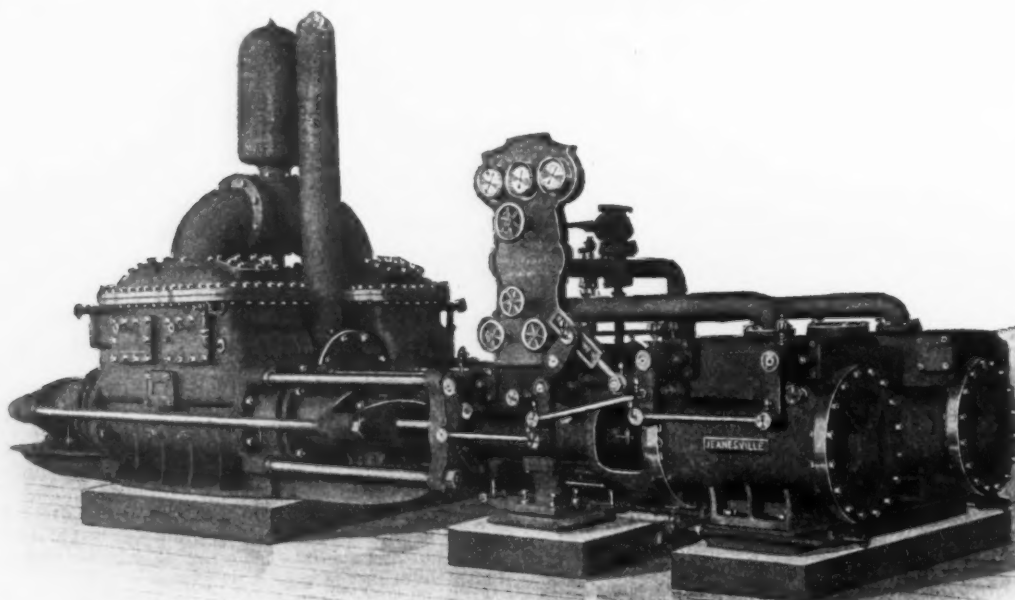
#### Specifications.

The following specifications governed the construction of this pump:

The plant provides for a pumping engine having 10-inch high pressure and 20-inch low pressure cylinders operating a 15-inch plunger, 24-inch stroke, fitted complete with the following component parts:

Both high and low pressure cylinders are cast on end in hard close grained iron, with thickness for reborring. They are arranged in tandem with high pressure in-board, and connected by heavy circular cradles. The low pressure cylinders are supported by bed plates tying the two together and the high pressure cylinders by adjustable columns resting on sole plates.

Both high and low pressure cylinders are fitted with Corliss valves, which reduce the clearance therein to 1½ per cent. of the cylinder volume. With this reduction in clearance space, and with adjustment in cushion valves, the pistons are run to the heads, making a perfect and economical steam control of power end. The steam valves are controlled by the duplex movement, having outside adjustable or lost motion links. The rocker



THE JEANESVILLE MODERN FURNACE PUMP.

not sufficient to enable importers to comply with the conditions of the bond.

"In view of the foregoing a period of 90 days is hereby substituted for the period of '30 days' mentioned in said form within which collectors of customs shall be notified that said machinery has been set up at the place of delivery or destination as aforesaid." W. L. C.

### The Jeanesville Modern Furnace Pump.

A stable and economical water supply has always been of importance to the successful operation of a blast furnace, but the construction of large and elaborate plants serves to magnify the necessity of providing the best possible apparatus. In view of this growing demand for a more economical and stable machine, the Jeanesville Iron Works Company, Jeanesville, Pa., illustrate and briefly describe a modern furnace pump as lately installed for the Penn Iron & Coal Company, Canal Dover, Ohio.

The requirements of this pump were: To furnish 3,000,000 gallons at a normal speed and in case of need to automatically increase to 5,000,000 gallons per 24 hours, without excessive strain or work upon the pump parts.

To run the pumping engine with 125 pounds steam, either condensing or noncondensing.

To run the pump for a long time without stopping to repack boxes or repairs.

In full, to furnish a pumping engine which can be

shafts are steel and work upon babbitted half boxes. The arms are keyed to the shafts and connected to plunger cross heads by links. All the links in the valve motion are bushed with steel, which can be easily renewed in case of wear.

The connection between the steam and water ends is effected by means of eight cold rolled steel tie rods, four to each side, passing through bosses in steel tie rod flanges on the steam and water cylinders respectively. As these tie rod flanges are bored and faced after the tie rods are inserted, perfect alignment of cast iron cradles is assured, combined with the greater stiffness and strength of the steel tie rod connection, and the further advantage of additional room for getting at the packing boxes and plungers.

There are two separate cylinders which contain both the suction and discharge valve docks, which are accessible through large hand holes in the sides. At the center of each cylinder there is fastened a separate flange and at each end a separate plunger packing box is bolted. The bronze valve seats are forced into the valve docks, and the soft rubber valve works upon them under curved guards.

There are four hollow plungers, cast of hard iron on end, turned and polished. Each pair of plungers is connected trombone style by parallel rods, which provide ample tensile strength and also stiffness to hold the plungers in a straight line and prevent sagging.

Attached to the working barrel in the rear and in front are guides, upon which the plunger cross head slides. These carry the weight of the moving parts of the water end. These guides are fitted with double



slides on each side of the cross head. The space between the slides is closed up and forms a pan which catches all the drip from the plunger packing boxes and the front packing box of the steam rods.

The engine is fitted with a gauge board and valve board, which puts within easy reach of the operator the gauges and controlling valves of the machine. There are also a steam, water and vacuum gauge, a cross exhaust and switch valve, three throttle valves, cushion valves, drain valves, air and check valves, sight feed lubricator, wrenches and oilers. Both suction and discharge are fitted with a large air chamber which compensates for the variation of the plunger movement. Thus the water is taken through the pump without shock, at a uniform velocity.

Attached to the steam inlet is a pump governor, which increases the flow of steam to the pump in proportion as the water is taken out of the discharge main and gives the pump less steam when the demand for water is reduced. To secure continuous operation all the packing boxes of the steam end are fitted with a spiral metallic packing, which reduces the friction, keeps the rods light and smooth and wears the same as a babbitted bearing.

The plungers are outside packed and guided by large double ways which carry the entire weight of the

### Twenty-three New Furnaces.

The last *Bulletin* of the American Iron & Steel Association contained notices of the erection of four new furnaces—two at South Chicago, by the Illinois Steel Company; one at Thomas, Ala., by the Pioneer Mining & Mfg. Company; and one at La Follette, Tenn., by the La Follette Coal, Iron & Railway Company. In addition to the above the Carnegie Steel Company are building two large furnaces at Rankin Station; the Buffalo Charcoal Iron Company have about completed a charcoal furnace at Buffalo, N. Y.; Joseph Wharton is building a new furnace at Port Oram, N. J.; the Warwick Iron & Steel Company are building a new furnace at Pottstown, Pa.; the American Steel & Wire Company are building a new furnace at Neville Island, near Pittsburgh, Pa., and are erecting an additional stack at their Central furnaces, at Cleveland, Ohio; Jones & Laughlins, Limited, are adding a new furnace to their Eliza plant, at Pittsburgh; the National Steel Company are erecting three new furnaces, one at New Castle, Pa.; one at Mingo Junction, Ohio, and one at Youngstown, Ohio, and are also building another stock at Mingo Junction to replace one of their old furnaces now in use; the Sharon Steel Company are erecting a new furnace at Sharon, Pa.; the Roane Iron Company are erecting a

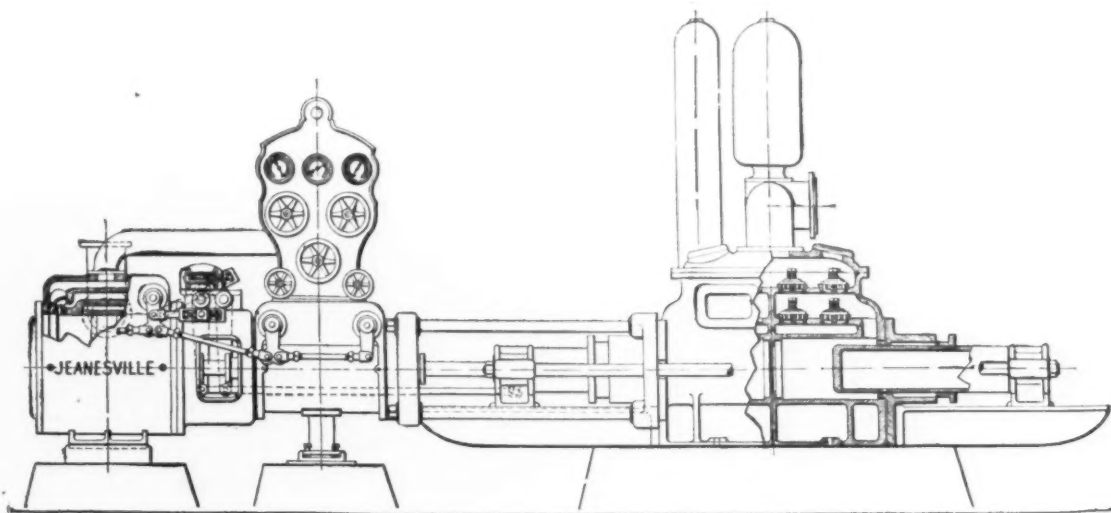


Fig. 2.—Longitudinal Sectional Elevation of Pump.

### THE JEANESVILLE MODERN FURNACE PUMP.

plungers, thus reducing the wear and friction on the packing boxes. The water passages are large and are direct through the pump, which admits of increasing the capacity from 3,000,000 to 5,000,000, in case of need, without any undue strain or friction. The working parts are all accessible in both steam and water ends.

In the Nanticoke station of the Pennsylvania Railroad Company this type of apparatus has a record of six years, 24 hours, pumping against 312-foot lift, without repairs except packing and a set of new pump valves at the end of four and one-half years.

The *Commercial and Financial Chronicle* says: "We estimated a short time ago that if we could have returns covering all the roads in the country, the gain for the six months would reach \$90,000,000. The figures above make necessary no modification of this estimate. In like manner, we estimate the gain for the first half of last year for the whole United States system of roads at \$42,000,000, and the gain for 1898 at \$68,000,000. In other words, in three years the gross earnings in these six months have improved \$200,000,000—that is, earnings in 1900 were that much better than in 1897, showing a very striking transformation."

The Chillcott-Evans Chain Company, Allegheny, Pa., manufacturers of chains for all purposes, have received an order from a shipping firm for a chain 500 feet long, to be used for anchorage purposes on a large lake vessel. The chain links are 1¼ inches thick, making one of the longest and heaviest chains ever turned out. The Chillcott-Evans Chain Company have numerous orders on their books, and are running their works full time.

new furnace at Rockwood, Tenn.; the Columbus Iron & Steel Company have about completed the erection of two furnaces at Columbus, Ohio; the Globe Iron Company are erecting a new furnace at Jackson, Ohio; the Iroquois Iron Company are erecting a new furnace at Chicago, Ill., and the Colorado Fuel & Iron Company are erecting a new furnace at Pueblo, Col.

**Railroad Earnings.**—In presenting its figures relating to August gross earnings of the railroads the *Financial and Commercial Chronicle* says: "As expected, gains in railroad gross earnings are now smaller both in amount and ratio. And yet, all things considered, the improvement continues remarkably large. Gross earnings show an increase on somewhat more than 101,000 miles of road of \$3,460,551, or 6.14 per cent. This is the result in face of a smaller corn movement in the West, a smaller cotton movement in the South, and at a time, too, when trade has been noticeably slackening and when enterprise has in a measure been held in check by the Presidential canvass. Of course, some of the separate roads reflect the presence of one or another of these adverse influences, but collectively the results are surprisingly good. A fact which should not be overlooked, either, is that the improvement this year follows particularly noteworthy improvement last year and improvement, too, in the two years previous. In August, 1899, our statement showed \$6,815,170 gain, or 13.48 per cent., while in the same month of the two preceding years the increase was respectively \$2,250,000 and \$5,000,000."

W. A. Steinmann proposes to establish an exhibition of samples at Zurich, Switzerland.

## The China Trade.

BY F. LYNWOOD GARRISON.

The annual report for 1899 of the "Returns of Trade Through the Chinese Imperial Maritime Customs" has just come into my possession, and I venture to send you some extracts, thinking that they may be of interest.

The total value of the foreign trade of China in the years of 1887, 1892, 1898 and 1899 was as follows. The figures are in Haikwan taels, one of which is equivalent to 73 cents of American money:

Years.	Net Imports. Taels.	Exports. Taels.	Total. Taels.
1887.....	102,263,669	85,860,208	188,123,877
1892.....	135,101,198	102,583,525	237,684,723
1898.....	209,579,334	159,037,149	368,616,483
1899.....	264,748,456	195,784,832	460,533,288

The proportion of this trade during the past seven years with the more important countries is given below. I have taken 1892, the first year for which returns are given, and have calculated in a further table the percentage of increase for the period from 1892 to 1899.

Countries.	Imports. Taels.	Exports. Taels.	Total. Taels.
Great Britain.....1892	28,870,150	10,476,249	39,346,399
.....1899	40,161,115	13,962,547	54,123,662
Hong Kong.....1892	69,816,916	49,701,434	119,518,350
.....1899	118,096,298	71,845,558	189,941,766
India.....1892	13,861,094	1,402,891	15,263,985
.....1899	31,911,214	1,731,498	33,642,712
Singapore and Straits.....1892	1,919,768	1,404,389	3,324,157
.....1899	3,646,195	2,231,792	5,877,987
Australia and New Zealand.....1892	320,169	1,625,807	1,945,976
.....1899	272,553	670,978	942,631
South Africa and Mauritius.....1892	.....	214,501	214,501
.....1899	.....	236,613	236,613
British America.....1892	694,904	159,151	854,055
.....1899	1,208,865	259,519	1,468,384

Similarly for the United States we have the following table of imports and exports:

	Imports. Taels.	Exports. Taels.	Total. Taels.
United States.....1892	6,061,900	10,784,655	16,846,555
.....1899	22,288,745	21,685,715	43,974,460
Philippine Islands.....1892	.....	.....	.....
.....1899	21,641	61,629	83,270
Total imports and exports for 1892.....	.....	.....	16,846,555
Total imports and exports for 1899.....	.....	.....	*44,057,730

\*Including Philippine Islands.

For Russia and its dependencies:

	Imports. Taels.	Exports. Taels.	Total. Taels.
Russia (Odessa by sea).....1892	391,044	1,955,460	2,346,504
.....1899	3,233,239	5,343,480	8,576,719
Russia and Siberia, via Kiakhta.....1892	.....	4,062,629	4,062,629
.....1899	.....	9,987,705	9,987,705
Russian Manchuria.....1892	159,709	1,025,161	1,184,870
.....1899	289,165	3,225,806	3,514,971
Total imports and exports for 1892.....	.....	.....	7,594,003
Total imports and exports for 1899.....	.....	.....	22,079,396

Continental Europe (Russia excepted):

	Imports. Taels.	Exports. Taels.	Total. Taels.
Continental Europe (Russia excepted).....1892	5,128,142	17,166,540	22,294,682
.....1899	10,172,398	36,763,506	46,935,904
Japan.....1892	6,702,302	8,053,732	14,756,034
.....1899	35,896,745	17,251,144	53,147,889

The following table gives the increased percentage of imports and exports in 1899 as compared with 1892 for the various countries named:

Countries.	Total Imports and exports for 1892. Taels.	Total Imports and exports for 1899. Taels.	Percent- age of in- crease in 7 years.
Great Britain and dependencies.....	171,467,423	286,233,755	60.00
United States and Philippines.....	16,846,555	44,057,730	38.20
Russia and dependencies.....	7,594,003	22,079,396	34.39
Continental Europe.....	22,294,682	46,935,904	47.50
Japan.....	14,756,034	53,147,889	28.00

These figures are given in taels, Haikwan, one of which, as already stated, is equivalent to 73 cents in American money. To be absolutely correct they should be changed a little by the re-export of foreign goods to foreign countries. Although the United States stands next to Great Britain in the volume of trade done with China, and nearly as great as all Continental Europe, exclusive of Russia, it is evident that we are not holding our own in the great industrial race. Of the great powers, if we disregard Siberia, we are the nearest neighbors to China. One great and serious drawback to the increase of American trade in the far East is the lack of banking facilities. At present all our business must be done through London, which is exceedingly expensive and decidedly inconvenient to the American merchant. The English, French, German, Russian, Japanese, and

even the Chinese have their own banks. The English, French, German, and Japanese have fine, well-equipped lines of steamships to all important points, while the proud American flag is represented by a few old tubs running from San Francisco. The ridiculous figure we make in the carrying trade of the East is strikingly shown in the following table, which gives the tonnage of vessels entering or clearing from Chinese ports in 1899:

Countries.	Tons.	Countries.	Tons.
British.....	23,338,230	Swedish and Norwegian.....	439,718
Japanese.....	2,839,741	Russian.....	361,501
German.....	1,854,246	American.....	310,107
French.....	613,191	Hawaiian.....	13,788

As shown above, we are second in the total amount of trade, and seventh in the amount of shipping.

In 1899 China imported iron as follows:

Articles.	Taels.	Piculs.
Nails.....	692,619	211,823
Bar iron.....	457,631	140,559
Hoop iron.....	69,869	19,997
Sheets and plates.....	508,093	108,820
Wire.....	258,891	48,421
Pig iron, &c.....	98,587	45,874
Old iron.....	1,044,503	636,875
Fin Plates.....	104,471	18,824
Totals.....	3,234,724	1,231,193

It will be noticed that about one-third of the total imports of iron and steel is old material. The 1,231,193 piculs equal about 82,080 net tons, a picul being equivalent to 133-1-3 pounds.

The metal imported and separately classed as steel was as follows:

Articles.	Taels.	Piculs.
Steel.....	443,679	83,256
Steel ingots.....	447,382	143,536
Totals.....	891,061	226,792

The 226,792 piculs of steel imported equal 15,119 net tons, or a total for both iron and steel of 97,199 tons.

It must not be supposed that this represents anything like the amount of iron and steel used by the Chinese, as it is certain that they produce considerable quantities from the native ore by their primitive methods; besides, the production of the large steel works at Han-yang must be considerable. In the near future I hope to be able to send you a description of the crude forges used by the Chinese.

China does not appear to export a pound of iron. In fact, no metals or even ores are mentioned in the customs returns for 1899, except some gold or silver ware. These returns, however, are not wholly correct, or rather are not sufficiently specific, as I know of considerable quantities of antimony ores having been exported. They have perhaps been classed under sundries.

When we consider that the mineral wealth of China is possibly as great as that of the United States, and that the coal area is even greater, it is certainly very strange that not a pound of any mineral product whatever is mentioned in the long list of her exports. This vast and splendid country, with its 400,000,000 of the most peaceful and industrious people in the world, is as undeveloped in its mineral resources as was the United States a hundred years ago. Its coal area has been estimated to cover over 300,000 square miles, its anthracite deposits being probably the largest in the world. Petroleum and natural gas I know exist in one province and probably in others. I have seen gold, silver, lead, zinc and antimony ores from localities which can be reached from Shanghai in a house boat. China cannot much longer passively resist the pressure of foreigners who are anxious to develop her unsurpassed mineral resources, and if American enterprise is not to be left entirely out of the competition for these riches it is time that serious attention be given the subject.

The Auburn Ball Bearing Company have been organized at Auburn, N. Y., with the following officers: Mark D. Knowlton, Rochester, president; Fred. A. Wiggins, Auburn, vice-president; Harry G. Latimer, Auburn, secretary; John E. Myer, Auburn, treasurer. The business will be under the direction of Mr. Myer as general manager. Henry LaCasse of Rochester will be superintendent of the manufacturing department. Ball bearing hubs and wheels for all kinds of motor vehicles will be a special feature of the business.

The new line of the Pennsylvania Railroad into the Masontown coke field has been taken off the contractors' hands and opened for traffic. The new extension embraces about 35 miles of road branching from Uniontown, Pa., and going direct to the Monongahela River. The main extension to the river comprises about 14 miles of track, and there are over 20 miles of bridges leading to the various new coke works in the region.



### Pennsylvania's Iron and Steel Industry in 1899.

The report of the Pennsylvania State Bureau of Industrial Statistics for 1899 shows that year to have been the most prosperous period ever experienced by the iron and steel industry of the State. During 1899, 6,542,998 gross tons of pig iron were produced, an increase over the previous year of 1,175,019 tons, the realized value of which was \$98,203,803. An average of 15,347 workmen were employed during the year in the making of pig iron, the average yearly earnings of skilled and unskilled labor being \$495.18, an increase of nearly \$100 over the preceding year.

Pennsylvania's production of steel was 6,446,159 gross tons, an increase of more than 22 per cent. over the year before. This output includes 3,971,835 gross tons of Bessemer steel; 2,398,210 tons of open hearth and 76,114 tons of crucible and miscellaneous steel. The entire production of iron and steel rolled into finished form was 7,093,485 net tons, making an increase over the year previous of 1,556,236 tons. The value of this production was \$233,377,126, an increase in the aggregate over the year before of \$96,556,684. The number of workmen, independent of those employed in the rolling of black plate, was 69,982, and the average earnings of

hereby amended by striking out the last paragraph of said letter, and inserting in lieu thereof the following—namely: 'In the liquidation of the entries, the basis of drawback shall not exceed 70 pounds of imported scrap for each and every 100 pounds of the exported structural material, provided, however, that not less than 62.5 per cent. of imported scrap is used. In case a less amount of scrap is used, a reduction shall be made upon the above basis.'

### An Organ for Russian Trade.

A new monthly publication, which is being published by the M. S. Friede Company of 320 Broadway, New York, is to be known as the *Journal of Industry and Trade*. It is printed in the Russian language, as it is to find its field for circulation in Russia.

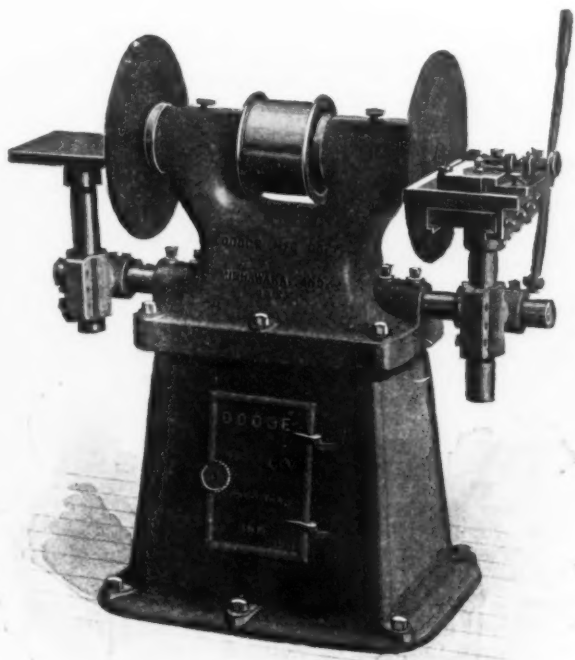
Accompanying the first number of the publication is a circular containing the following regarding opportunities in Russia: Capital wisely and prudently invested in Russia offers to the keen American business man the same opportunities the United States offered 70 years ago, with the additional advantage of a large population very friendly to the Americans. Notwithstanding the latter fact American manufacturers in general are discredited and handicapped in Russia, because European manufacturers, especially Germans, fill the Russian market with inferior goods stamped as "American," which being accepted by the unsuspecting Russians as genuine American products, discredit our manufactures to such an extent that nothing short of active and persistent personal effort can push our goods into general use there. Another reason which speaks against the introduction of American manufactures in Russia is the long credits given by the British, French, German and other manufacturers. The manufacturers and business firms in the United States are in the habit of doing business on 30, 60 and 90 days, which time is too short for Russian purchasers, who usually require and do business on 6, 9 and even 12 months, but are willing to pay and do pay prices accordingly. The American exporters besides are not well enough acquainted with the Russian trade, and seem to lack confidence in the Russian merchant; consequently many goods from the United States are sold first to English commission men, who are better acquainted with the Russian trade and sell the same goods to Russia on the desired terms, charging their profits thereon. The American must overcome these difficulties; he must employ the same methods abroad that he does at home to create a demand for his goods; he must not be sparing in the use of printers' ink, the surest and most direct way to bring his wares to the attention of the consumer. The American aggressive methods that are used at home are the methods that will always succeed abroad.

### The Dodge Disk Grinding Machine.

The grinding machine here shown has been designed by the Dodge Mfg. Company of Mishawaka, Ind., for grinding off the rough surfaces on drop forgings and castings of all kinds where the finished surface is flat, such as dies, gibs, wrenches, parts of machine tools, &c. It will also grind faces to an accurate right angle or any intermediate angle between 45 and 90 degrees, and produce parallel surfaces. The emery cloth or paper is secured to both sides of the disks, which are true and flat, by a quick drying cement, a press being provided for doing this work. The worn emery sheets can be readily stripped off. The machine is provided with ring oil bearings with taper bushings to take up wear, and is dust proof. It is also furnished with a graduated rest for grinding keys of any taper. The following are the main dimensions: Floor space, 26 x 50 inches; height, 57 inches; size of table, 9 $\frac{3}{4}$  x 10 inches; diameter of disk, 18 inches by  $\frac{1}{2}$  inch thick.

The Pressed Steel Car Company of Pittsburgh have received an order for 70 cars for shipment to Spain. The outlook for a large foreign business in steel cars is regarded by the company as very bright. Their exhibit at the Paris Exposition has done much to advertise their cars abroad and bring them to the attention of the management of leading foreign roads.

The Wellman-Seaver Engineering Company of Cleveland, Ohio, and Victoria street, London, are now working upon plans for three large open hearth furnaces of the Wellman type for Vickers, Sons & Maxim of Sheffield, two large open hearth furnaces for the Northeastern Steel Company of Middlesbrough, two furnaces for the Brymbo Steel Company, near Wrexham, and two furnaces for Lord Dudley's Round Oak Works, at Dudley.



THE DODGE DISK GRINDING MACHINE.

the men, skilled and unskilled, was \$559, against \$495.81 the year previous. This does not cover the advance of wages made during the year, which did not become effective for the full period covered by the report.

The tin plate industry of Pennsylvania makes an equally satisfactory showing. During the last year the 21 black plate works produced 368,600,734 pounds of black plate, as against 344,004,000 the year previous. The aggregate tinned production for the year was 331,082,734 pounds, as against 262,934,000 pounds the year before, an increase of more than 25 per cent. Pennsylvania's share of the entire tin and terne plate production of the United States last year was about 37 per cent. The number of workmen employed in the black plate works was 7682, and the average daily wage was \$2.36. In addition to the 21 black plate works, there are in Pennsylvania seven dipping works, and the aggregate value of the production of these plants last year was \$12,165,879, an increase of over 44 per cent. over the year previous.

**Drawback on Structural Material.**—The Treasury Department has rendered the following decision, under date of September 8: "Referring to Department's letter of June 1 last, establishing a rate of drawback on structural material, such as plates, beams, channels, angles, bars, &c., manufactured by the Carnegie Steel Company of Pittsburgh, in part from imported rail scrap and domestic pig iron, I have to inform you that the regulations are



## THE WEEK.

A press dispatch from Steubenville, Ohio, reports the closing of the largest coal deal ever transacted in Eastern Ohio. By the sale, 18,000 acres of coal lands in Warren, Wells and Smithfield townships pass into the hands of Cleveland capitalists. The options were taken by H. E. Willard. Extensive mines will be opened and several branch roads will be constructed. About \$500,000 will be paid into the hands of land owners in a few days.

The bankruptcy returns for the United Kingdom for 1899 show a decrease of 481 failures and of \$6,250,000 in liabilities in that country, as compared with the preceding year.

The August record of incorporations of companies with \$1,000,000 capital and over shows a decline in the movement of industrial consolidation, the combined capitalization of such companies—\$99,900,000—being the smallest amount of any month of this year, and a little more than half as much as the July figures. No new company with more than \$5,000,000 capital was incorporated last month. Of the States, West Virginia secured \$48,400,000 of the new charters and New Jersey \$33,300,000.

The monthly circulation statement of the Treasury Department shows the amounts of gold coin and certificates, silver coin and certificates and United States and bank notes in circulation in the United States on September 1 to have amounted to \$2,096,683,042, an increase of \$154,551,901 since the same date last year.

The officially corrected speed for the four hours' run of the new battle ship "Alabama" gives the vessel a record of 17.019 knots an hour. This was accomplished under favorable conditions with 1500 tons short of the weights the ship would carry on a long cruise. Nevertheless, the performance of the "Alabama" is regarded by the Navy Department as eminently satisfactory, and reflecting great credit on her builders, the Cramps of Philadelphia. The "Wisconsin," the sister ship to the "Alabama," built by the Union Iron Works of San Francisco, will have her trial trip off the California coast within two weeks.

The Minneapolis flour mills, whose year ended August 31, eclipsed all the previous performances in the history of the city's industry with an output of 14,500,000 barrels of flour. The mills used between 62,000,000 and 65,000,000 bushels of wheat during the past year.

The next meeting of the Southern Industrial Association will be held in New Orleans, La., probably between December 5 and 15. It is contemplated to hold a five days' session, during which subjects bearing upon the various industrial interests of the South will be discussed. Among the selected speakers are Nat Baxter, Jr., president of the Tennessee Coal, Iron & Railroad Company and A. B. Fargahar of York, Pa.

The Canadian Minister of Finance announces the revenue of the Dominion for the past fiscal year to have been \$50,927,941, leaving a surplus of \$7,940,392.

The pressure of trade competition which has developed in recent years has prompted the British Government to initiate an extraordinary method of impressing foreign buyers with the superiority of Great Britain as a manufacturing nation. According to a report from United States Consul Halstead at Birmingham, England, a scheme has been arranged to scatter broadcast over the commercial world experts in matters of trade to lecture on British manufactures in every important business center of the globe.

The big Hamburg-American liner "Deutschland" again broke the transatlantic record on her journey last week from New York to Plymouth. The "Deutschland" accomplished the run of 2982 miles in 5 days, 7 hours, 38 minutes, making an average speed of 23.36 knots an hour for the trip and beating the best previous record—her own made last month—by over four hours. She beat the "Kaiser Wilhelm der Grosse," of the North German Lloyd line, which started from New York at the same time, by 4 hours and 20 minutes.

The report of the Department of Agriculture on the condition of the various crops of the country on September 1 indicates a decrease in the wheat yield, as estimated on August 1 of 5,000,000 bushels and a decline of 175,000,000 bushels in the corn crop. The following are the Department's figures: Wheat, 508,733,000 bushels; corn, 2,015,860,000 bushels, and oats, 777,280,000 bushels.

The following significant cable dispatch from Berehaven, Ireland, was received under date of September 10: "The ships of the British Channel squadron are now here refilling their bunkers with American coal from colliers chartered by the Admiralty."

The fire loss of the United States and Canada for the month of August, as compiled by the New York *Journal of Commerce*, was \$10,298,250, as compared with \$13,609,100 in July. The total loss for the eight months ended August 31, 1900, is placed at \$127,206,250, as against \$86,829,850 in August, 1899, and \$74,960,350 in the same month of 1898, a very serious increase.

The contest of speed and size among transatlantic steamship lines is to be carried on still further by the North German Lloyd Company, who have under construction two new vessels which they expect to eclipse the performance of their present champion, the "Kaiser Wilhelm der Grosse," and, if possible, that of the Hamburg-American liner "Deutschland." They are being built at the Vulcan Works at Stettin, and are to be called the "Kaiser Wilhelm II" and the "Kron Prinz Wilhelm." Speed is to be specially considered in the building of the last named vessel, which is expected to sustain a rate of about 24 knots across the Atlantic. The "Kaiser Wilhelm II" will be 706 feet long, or a little longer than the "Oceanic," about 20 feet longer than the "Deutschland" and 60 feet longer than the "Kaiser Wilhelm der Grosse." She will have 70 feet beam, a tonnage of 15,000 and 33,000 horse-power. Both vessels are to be ready for service in a year's time.

President Loubet of the French Republic, who was the arbitrator appointed to decide the boundary question between Costa Rica and Colombia, has given his award, which disallows the claims of Colombia. That country claimed the whole of the Atlantic Coast line of Costa Rica and a portion of her Pacific Coast territory. The award fixes the boundary line in the Pacific side at Punta Barica, and on the Atlantic denies the right of Colombia to any portion of the territory of Costa Rica beyond Mona Point or to any Nicaraguan territory on that seaboard.

Chief Statistician Powers of the Census Bureau states that although the enumerators' sheets are not all in yet, it is already known that there are in the United States between 5,500,000 and 6,000,000 separate farms.

Cotton exportations and movements are measured usually by what is termed the "cotton year," which ends with the month of August. The figures of the Treasury Bureau of Statistics, just issued for the 12 months ended August 31, show that the exports of raw cotton during that period, \$245,485,209, were greater in value than in any preceding cotton year since 1892, while the average price per pound—7.96 cents—was greater than since 1893. The average export price of cotton in August, 1900, was 9.7 cents, which is higher than the average of any year since 1891, all of which tends to the prosperity of the South.

President C. N. Schwab of the Carnegie Steel Company returned on Saturday, by the "Lucania," from a visit to Andrew Carnegie in Scotland.

The Manufacturers' Association of New York has appropriated \$500 annually for four years to defray the expenses of giving a young man an industrial education.

The report of the New York State Bureau of Labor for the second quarter of this year shows an addition of 151 unions and a gain in union membership of 15,069 in the labor organizations of the State during the three months ended June 30, 1900. On that date there were 1603 labor unions, with an aggregate membership of 247,602, reported.

The Carroll-Porter Boiler & Tank Company of Pittsburgh, whose plant was destroyed by fire some time since, are figuring on the erection of a new works for the building of steel barges for carrying ore, coke and coal. The plant will be built in the Pittsburgh district, but the exact location has not yet been selected. It is predicted that eventually steel barges will supplant wood barges, and it is expected there will be a heavy demand for steel barges when the change takes place. It will be recalled that Jones & Laughlins, Limited, are building some steel barges to haul coal from their mines up the Monongahela to their works on the South Side, Pittsburgh.

Officials of the Republic Iron & Steel Company have stated that unless the Amalgamated Association concede them a scale similar to the scale granted the Bay View Mills of the Federal Steel Company, that the idle mills of the Republic Iron & Steel Company will be started up independent of the Amalgamated Association. G. W. French of the Republic Iron & Steel Company states that it is not the desire of his concern to antagonize the Amalgamated Association, but it is their intention to operate their mills on the same terms as granted other manufacturers. If this cannot be done, they will run independent of any labor organization.

# The Iron Age

New York, Thursday, September 20, 1900.

DAVID WILLIAMS COMPANY,	-	-	-	-	-	PUBLISHERS.
CHARLES KIRCHHOFF,	-	-	-	-	-	EDITOR.
GEO. W. COPE,	-	-	-	-	-	ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS,	-	-	-	-	-	HARDWARE EDITOR.
JOHN S. KING,	-	-	-	-	-	BUSINESS MANAGER.

## Consolidations as a Source of Increased Competition.

Those who are, or pretend to be, opposed to the trusts and consolidations take a good deal of pains to exaggerate their enormous power. Their cue is to frighten the public with visions of grasping monopolies who throttle the consumer with one fist and shake labor into slavish submission with the other. The iron industry comes in for its share of attention as one in which the number of these monopolies is particularly large—although the eloquent guardians of the human race fail to observe that their logic must be somewhat at fault when they apply the title of monopolies to a number of concerns in one industry. We are told almost in one breath that the trusts are robbing the public by extortionate prices and that the fact that they have closed down many plants is evidence that the much vaunted prosperity does not exist.

Now, as a matter of fact, if there is any cause for uneasiness in the iron trade as to the future, it is that competition with the great consolidations has been increasing and threatens the stability of the trade. That competition may be classified roughly as being external and internal. The former word may be used to designate those plants which have been started as entirely new enterprises, to share with existing consolidations the liberal profits which they are shown to have earned by their published reports. The "internal" competition is that which comes from the invasion of the territory of one consolidation by another "trust."

The sharp drop in the prices during the last few months has probably nipped in the bud many enterprises projected to worry one or the other consolidation into a purchase of the competing plant at fancy figures. In some instances "outside" undertakings have been started by men who had sold out at a handsome profit to the very "trust" which they attack. It may be said that this is inevitable because there are no means to tie down retiring interests. In this way some very ambitious and, let it be added, some, to the trusts, very dangerous enterprises have been started.

But what looks like much more disquieting competition is that which is developing among the different "trusts" themselves. With one exception, all those large consolidations which did not already go back to the ore have striven to secure independence of the great steel making concerns by acquiring ore and coal property, and developing furnace and steel capacity. In that way they have deprived, or threaten to deprive, the large steel makers of an outlet for a considerable part of their tonnage. The result is that threats to invade this or that field have been numerous, and in some instances are being carried into effect. Competition thus develops which is on a very different basis from that between a moderate sized outsider and a huge consolidation. It becomes a strife between the giants themselves, in which heroic measures are often and suddenly taken.

That such developments are not calculated to do the iron industry any good in the long run is evident, because they lead to additions to capacity which are wholly unnecessary. Even without any new comers the productive capacity is growing simply through the fact that every consolidated group is remodeling and concentrating superannuated plant and is making improvements. It really looks as though competition, far from being done away with, may become fiercer at times than it ever has been. The corrective to the dangers of the fusion of interests during the past 18 months is being applied even more quickly than has been thought probable. The more arbitrary the "trust" management the more rapid apparently has been the advent of the dangerous rival.

## Public Sympathy in Strikes.

Whenever a struggle of any magnitude takes place between employers and their men the newspapers constitute themselves the judges of the merits of the contest and announce that "public sympathy" is either with or against one of the parties. The statement is reiterated at every occasion that the support or withdrawal of public sympathy is a powerful factor in determining the issue. Readers of the press have had this dinned into their ears for so many years that probably the majority of them have become convinced that they are face to face with an industrial axiom.

It is worth while to inquire whether this is really a fact, whether the "public" is entitled to be a court of last resort, whose "sympathy" is a powerful factor in all cases. We are rather prone to attribute to the people a capacity for discrimination which it does not possess. It has become almost a heresy to doubt that the American people are infallible when reaching a conclusion in economic and financial problems, and yet history proves that our country has gone through some very expensive experiences before shaking off wild schemes.

It would be idle to deny that "public sympathy" does count for much in many strikes or lockouts, and it is certain that the public is entitled to consideration in the conduct of enterprises which have assumed public functions in consideration of special privileges granted to them. Where charters have been granted which give partial or complete monopoly in performing a public service, the people, whose servants both the employer and the employee are, must be accorded the rights of a third party in interest.

It is a very different matter with purely manufacturing enterprises. The men have an undoubted right to cease work if the terms do not suit them, and the employers, on the other hand, must decide for themselves whether or not they desire to continue production under conditions which are unsatisfactory to them. Either party, being contributors to the taxes of the community, are entitled to demand that they be protected against unlawful aggression on the part of the other. It is their right, no matter whether the newspapers or the majority of the community decide that their sympathies should go out to the other contestant.

Unfortunately the laws are not always enforced in obedience to the dictates of what is absolutely right or just. Those in whose hands their execution rests are often swayed by their own notions on the merits of the case, or by the expressed "sympathy" of the public. To what lengths the local authorities will go has been only too often proven. In other words, "public sympathy" is frequently the mainspring of downright wrong, and the sooner that fact is recognized the better for all,



since the first necessity for the welfare of a community is that its laws be enforced and right and justice prevail.

A general agitation is progressing in Germany to revise the tariff on metals and metal products. We have already referred to the plan to increase the rates on machinery so that the imports of American machine tools and machinery be checked. A vigorous effort is to be made also to impose higher duties on copper on the ground that German industry is in danger of being under the control, as to prices, of foreign mines. While the consumption of copper has more than doubled since 1890, rising from 45,000 tons to 95,000 tons, the production of the country itself has gone only from 22,000 tons to 32,000 tons. By fostering the home mines through the medium of higher duties the growing dependence upon American makers is to be checked.

## CORRESPONDENCE.

### Notes on the Early History of Rail Making.

*To the Editor:* The immense importance of your valuable journal is so well known and appreciated by the public, more particularly throughout the great manufacturing portion of this country, that it certainly gives it additional value when used as a means of handing down to future generations the progressive events which characterize the iron and steel industry of our age and country. This has led me to ask your permission to correct many very inaccurate sentences which abound in a lengthy letter published in *The Iron Age* of August 2, 1900, under the signature of Robert W. Hunt of Chicago, Ill.

#### ROLLING THE FIRST IRON RAIL.

He gives an interesting history of the first iron rail made in America. As it is a matter of record, no one can dispute the fact that the first T rail ever made in this country was made in Danville, Pa., and as I played a very humble part in helping to make that rail, I trust you will permit me to put on record also those who were actively concerned in making the first rail. I will add also that every word I may write in relation to it can be substantiated by a number who were present and know the facts as well as myself. The iron was puddled by Joseph Bickley, who was afterward the puddle boss, and Wm. Booth. It was hammered (there were no squeezers then) by Thomas Bucknall, aided by John Kearman. The iron was rolled by James Lee; catcher, John Lee; hooker, C. Lewis. Wm. Hancock, who in after years in partnership with John Foley became the proprietors of Rough and Ready Iron Works, Danville, Pa., was the stocktaker; he sheared and piled the iron up that was rolled into the rails. John Stanton and Stephen Love heated the pile and dragged it to the rolls (there were no buggies then). Wm. Evans and Thomas Harris, roughers; Thomas Lee, catcher. James Lee, John Lee, Wm. Jones and Wm. Twist were hookers on the catcher's side. Wm. Harris, who designed the mill, built it and superintended it, rolled the rail. Hookers on the rollers' side were Joseph Hughes, M. S. Ridgeway and Wm. Evans. As I am fully convinced the names of those who made the first rail—T, I mean—ever made in this country have never been recorded, you may be willing to use *The Iron Age* for the purpose of transmitting the information to those who desire it.

#### INTRODUCING DRIVEN TABLES.

So far I have no dispute with Mr. Hunt, but when he says, "It was the writer's fortune to introduce the first driven tables, for making rails, at Troy, N. Y.," I want to ask him who is the real author of tables for dispensing with hooks and tongs? He says he introduced them in 1884. If any one will turn to the Patent Office reports of 1881 they will find my patents recored in the month of October. The patent was granted in the spring before, but not issued until six months afterward, as I intended then to patent them in foreign countries. If Mr. Hunt or any one else ever patented any automatic machinery for working rails on tables I would like them to show up. The Pennsylvania Steel Company searched in vain, not only in the records of this country, but through every country in Europe, to try to find something that would anticipate my patents; but the man they sent came back without being able to find a single thing that they could use against me, to justify the District Courts in robbing me of my patents. No one believes that it would have had any effect in changing the result, as the decree had

gone forth that I was to be sacrificed for the benefit of corporations, and the judges very willingly performed their part of sustaining the most gigantic patent robbery that has ever been perpetrated in this or any other country. I defy R. W. Hunt or any other man to show anything that will lead any one to suppose that any man had ever entertained an idea that rails or shapes of any character could be rolled by machinery without hooks and tongs before the date of my patents.

In this connection allow me to mention an event which occurred between myself and Wm. R. Jones, so well known as one of the ablest rolling mill managers ever known in this country. I had been to Washington looking after the patents alluded to, in January, 1881, and on my way home I stopped at Braddock to see Mr. Jones, but was informed that he would wait for me at the main office in Pittsburgh. I met him there, and in conversation I said: "In a short time I will show you how to roll rails without the use of tongsmen or hookers." He laughed incredulously at the idea. Said he: "If it was to handle cold iron or steel, I would say it might be possible for you to do it, but to handle hot iron and steel requires brains and muscle." I told him I was making a model that would practically demonstrate whether I could do it or not. He said: "When you have it ready let me see it, will you?" I replied that he should be the first man to see it. When I had finished it I wrote him that I was prepared to show him how to roll rails without the aid of labor. He did not reply to my letter, but came, as he said, on the first train after receiving it, to Columbus, Ohio. When I showed him the model he examined it very closely for some minutes, then, turning to me, he said, "By G—d, old fellow; you have it all here." I then picked up a number of lead ingots which I had made for the purpose, and said: "Let us make a few rails." I worked the model and tables to show him how they were turned. When the first rail was finished he was almost frantic. In fact, I never saw a man more surprised. I said: "I want you to examine it particularly and see if you think it entirely practicable." He said to me, "I want to say to you that I certainly am surprised, and I admit candidly that it is entirely practicable. All you want is power and you can roll all the rails you want to." He stayed with me until evening and then left as I thought for home. The next morning he came down to the mill again and said to me, "I want to examine that model again." He then said to me, "I want to turn that model and you roll a rail." After that was finished he said, "I want you now to have two rails in the rolls at once." When the two were rolled, he said, "Now I want you to have three in the rolls at the same time." After we had finished the three rails which were in the rolls at the same time he looked me right in the eyes and said, "Do you know what strikes me as the most singular thing in this whole business? It is the fact that one can hardly perceive any difference in the amount of power required to work one rail or that which seems necessary to roll three." After he returned home he wrote me, and I copy from his letter these words: "The more I think over your model the more I am convinced that you are entitled to, and will receive, the honor of having been the first to demonstrate to the world the practicability of rolling rails by mechanical means without the aid of skilled or unskilled labor." Soon after this I exhibited my model to hundreds of the best practical men in the iron and steel business, and no one, after seeing it, ever doubted its practicability. Some men came from England, France and Belgium, thinking I intended taking out patents in those countries, and they wanted to control them in case I did. I also received many letters from the Joliet Iron & Steel Company wanting me to name a sum that I would sell the right of my patents west of the Ohio River for. I still have the letters. Notwithstanding all this, we find men at this late day assuming a right which they must know is impossible for them to substantiate. What wonder the decision of the District Courts was such a perversion of justice, that any man from the time of Adam to the present time might with equal freedom claim to be the original inventor. This doubtless prompted R. W. Hunt to believe that he and others were the originators of automatic tables in front of rolls in 1884, while the patent records at Washington will show that my patents were granted in the spring of 1881 and issued in the month of October in the same year, nearly four years before he claims to have thought of it. In the summer of 1881 my model was on exhibition at Columbus, Ohio, and Harrisburg, Pa.; also at Philadelphia for nearly three years subsequently. At these cities it was seen by thousands of practical men and men identified with every iron and steel manufacturing institution in this and other countries.

Mr. Hunt says that Wm. R. Jones offered to give him the whole thing, saying that he was the first to put this matter in practical shape and deserved it. From this it would appear that Wm. R. Jones laid some claims to the patents with him. Allow me to refer to a conversa-



tion I had with Captain Jones two years after this time. I was then superintendent of the Lochiel Iron Company the second time. The employees of the works had been on an excursion to Gettysburg, Pa. On September 11, 1886, on our return home, when we arrived at Carlisle Junction our train was connected to the regular Cumberland Valley train. Capt. Wm. R. Jones, with two young men whom he informed me were chemists that had been with him prospecting for ore in the Shenandoah Valley, knowing that I was then superintending the Lochiel Works, and having learned from some of the passengers that I was on the train, hunted me up. When he came up to me he said, "What have you done about making the — Steel Company pay you for your patents?" I replied, "Nothing yet." Said he, "What in h—l do you mean? Why, every one that is in any way concerned in the business knows that they are your patents, and you can get hundreds of witnesses to prove it if necessary." I told him I was well aware of that, but that I had not sufficient money to fight it through. "Nonsense," said he. "You need no money of any account. Just go to some good patent lawyer, and if you can't find one I will find one for you. Give him an interest in what he collects, and plenty of them will take it and fight it through for you, with little expense to you; and if you lack sufficient money to meet expenses, come to me; I will never see you stick while I have a dollar." I thanked him, and said: "Then, suppose I commence on your company; you are using my patents as well as the — Steel Company." "No," said he, "don't do that; you need have no fear about our company, they will pay you without any trouble when you make out your claim; but you can't expect them to pay you until you make the — Steel Company pay, as they were the first to use your patents." He said much more that I do not care to repeat now that he is dead. One thing more I will say to prove the generosity of his nature. He had requested me to keep him posted on the trial, which I did, and he wrote me several times denouncing the manner in which the suit was being conducted. Nine days before he was burned to death he wrote me a letter in reference to one witness which the — Steel Company had examined as a mechanical expert, asking me to put him on the stand in rebuttal to his testimony, for, said he: "I cannot bear the idea of you being robbed of your patents, which I know so well are yours; and while I would prefer to keep in the background, yet I will cheerfully come if you need me; but whether I do or not, you can rest assured I will never allow any party to use me to aid them in assisting to rob you." From this I inferred that they wanted to use him as a witness against me, which he refused to do. The terrible calamity which resulted in his death was to me an irreparable loss, as I intended to put him on the stand as my last witness to rebut those produced by the — Steel Company, but fate decreed otherwise, and to his sad death I must attribute my loss, not only of my patents, which were as honestly due me, as the original inventor, as any patent ever issued from the Patent Office of America.

#### THE FIRST STEEL RAIL.

This is not the only error in Mr. Hunt's letter to which I take exception. He says the first steel rails made in America were made at the North Chicago Rolling Mill in May, 1865. This is certainly news to me and certainly would be to A. L. Holley if he were living today. In the summer of 1866 Mr. Holley commenced to build the steel works at what was then called Baldwin, now called Pennsylvania Steel Works, near Harrisburg, Pa. I was then superintending the Lochiel Works about one mile west of the steel works. As soon as Mr. Holley had the converting department ready I became acquainted with him through the president of our works, who introduced him to me as the gentleman who was going to build the steel works, and any assistance I could render him in any way would be appreciated by the Lochiel Iron Company, as most of the stockholders were also stockholders in the new steel works which Mr. Holley was building. From this event we became very intimate, and, as he requested, I rolled some test ingots which he sent up to me every morning and evening, parts of which were returned to him numbered as he directed, to enable him to discover the proper mixture to make steel suitable for rails. In our conversation he told me that he had no difficulty in gaining the theoretical knowledge to build steel works, for which purpose he went to England in the employ of those who had secured the right to use the Bessemer patents in America, but said he: "I had great difficulty to get at the practical part of making steel, from the fact that the men would conceal or mislead me in my efforts to get at the facts in making steel." One day he and our president came to me and informed me that Mr. Holley had got some ingots that had been made by Colonel Wright, who had built a steel works for making locomotive tires and other work of a similar character near Lewiston, Pa. They were

called, I think, "Freedom Iron & Steel Works," and asked me if I thought we could roll them on our train of rolls. I told him that we could try, but as ours was only an 18-inch train, there might be some risk about being able to do it. Our president then directed me to try it, and any damage Mr. Holley would be responsible for. I was then ordered to put in the rolls for making the section of rail used on the North Carolina Railroad, when it would suit us best to make them, and to notify the president when the ingots arrived, as there were a number of gentlemen who wished to be present when they were made if we were successful. Particularly I was urged both by Mr. Holley and our president to see that Mr. Holley was there to see them rolled, as the matter was of great importance to him. A few days afterward, as arranged to suit all parties, we attempted to roll the ingots. As I had by this time considerable experience in heating the test ingots for Mr. Holley, I paid particular attention to heating the ingots which we were about to attempt to roll into rails; but as they were very high in carbon, and therefore very hard to get through the rolls, we tried four before we succeeded in rolling a perfect rail. The fifth one went through all right and made a perfect rail. We were then in good hopes of making perfect rails of the three remaining ingots, but the next one broke the middle finishing roll, and that closed the experiment. Mr. Holley was delighted, however, and said that the only difficulty in not being able to roll all the ingots would be easily overcome, and wound up by saying, "Three cheers for the first steel rail ever rolled in America." This was repeated in the presence of a number of gentlemen who were present, including Thomas Scott, president of the Pennsylvania Railroad; Colonel Wright, General Simon Cameron, Wm. Calder, president of the Lochiel Iron Works; Joseph McClellan, general manager of Lochiel Iron Works, and many others, some of whom are still alive, among them J. D. Cameron, president of the N. C. R. R. at that time. This rail was laid on the North Central at some point east of Baltimore on an exceedingly heavy grade, where the life of an iron rail was said to be very short. This steel rail was laid with an iron rail on the opposite side, and I was told by Mr. Calder and also shown a report from the superintendent of the division that it wore out 17 iron rails. So much for what has always been the impression of many, as well as myself, about the first steel rail ever rolled in America. Of one thing I am positive. If A. L. Holley were still living he would sanction what I have here written, as he had done so in many subsequent conversations with me in reference to it.

Mr. Hunt is in error in another matter of which I am very positive. He says it was the writer's fortune to become connected with rail making in 1856, &c. Now I think Mr. Hunt must admit that to me he is indebted for the practical knowledge he acquired of rolling mill work. His uncle brought him to me, and said he would like him to learn the practical part of making iron, and wished I would take him and teach him to heat. I did so, and spent many hours with him after he became proficient enough to heat tops and bottoms opposite me. But this was in 1858. So that as I know he is mistaken on this point, I think he was mistaken in reference to the other matters also; and as I am, perhaps, more than any one else concerned in having these matters truthfully laid before the public, I hope you will please give this publicity through the pages of your valuable journal and confer a favor on

Yours very respectfully,

CHRISTOPHER LEWIS.

LORAIN, OHIO, August 21, 1900.

#### Robert W. Hunt's Reply.

We have submitted Mr. Lewis' letter to R. W. Hunt of Chicago, who writes:

*To the Editor:* I have known Mr. Lewis even longer than he states, as our acquaintance began in 1856, and not 1858, as he states. He was a heater in a rolling mill at Pottsville, Pa., then owned by John Burnish & Co. of which firm my cousin, Thos. W. Yardley, was the principal partner, so that any communication which Mr. Lewis may have had from a relative of mine on the subject of giving me instruction must have come from a cousin and not from an "uncle," as he states.

Mr. Lewis, as well as many other employees in the mill, was kind and polite to me at that time, but he was never my principal instructor; as my gratitude in that line goes to the memory of Joseph Rushton, under whom I puddled, and subsequently went with him when he was promoted to a top and bottom heating furnace. The mill alluded to was afterward owned by the Atkins Brothers, Pottsville, Pa.

At the risk of boring you I will go over Mr. Lewis' letter. I have no doubt that what he says about the part

he played with the first T rail made in Danville, Pa., is true, as I know that he, at one time, was employed in that place.

I must adhere to the statement I made in my London paper, that it was my fortune to introduce the first driven tables. I did not claim to have invented the first. I was then aware that Mr. Lewis had a model covering automatic machinery for handling rails, but I had never seen it, nor had it been described to me; and I think I venture nothing in stating that his design was never actually put in practice. At the same time I became acquainted with the fact that Capt. W. R. Jones had examined Mr. Lewis' working model, but of course I have no knowledge about any of the details of his intercourse with Mr. Lewis at that time. I only know that I made the practical application at Troy, and that following the successful practical working of my design, Max M. Suppes joined me in devising and applying additional ones, and that my application for patent made to the United States Government on May 8, 1884, resulted in Letters Patent No. 310,893, dated January 20, 1885, being granted me. This was followed by another application on September 29, 1884, and the granting of Letters Patent No. 312,640, dated February 24, 1885. And that Mr. Suppes and myself made application on May 31, 1884, which resulted in Letters Patent No. 311,899, dated February 10, 1885, being granted us, and that on April 28, 1886, I made another application, on which Letters Patent No. 348,216, dated August 31, 1886, were granted me.

Mr. Lewis refers to my stating that "W. R. Jones offered to give me the whole thing, &c." I did, and do, say that Captain Jones offered to give me his patent applied for July 20, 1885, issued April 27, 1886, No. 340,917; and I do state and can prove that under the arrangement, or partnership, made between Captain Jones, Mr. Suppes and myself, that we granted rights to use the above mentioned patents to the Troy Steel & Iron Company, Troy, N. Y.; the Union Steel Company of Chicago; the Illinois Steel Company of Chicago; the Joliet Steel Company of Joliet; the Pennsylvania Steel Company of Steelton, Pa.; the Lackawanna Iron & Steel Company of Scranton, Pa.; the Cambria Steel Company of Johnstown, Pa.; the Worcester Steel Company of Worcester, Mass., and the Carnegie Steel Company of Pittsburgh, Pa.

In regard to Mr. Lewis' taking exception to my statement that the first steel rails made in America were rolled at the North Chicago Rolling Mill in May, 1865. I can only refer to Swank's "Iron in all Ages," in which the circumstance is detailed in full. At the time I was representing the Cambria Iron Company at the experimental works, at Wyandotte, Mich., and following the occasion of rolling the rails, we there had a visit from a number of the gentlemen who had been present at said rolling, and I am confident that both George Fritz and E. Y. Townsend of the Cambria Company described to me what they had seen the day before in Chicago. The steel from which the rails were rolled had been made at the Wyandotte Works by William F. Durfee.

Mr. Lewis states that in the summer of 1866 Mr. Holley commenced building the Pennsylvania Steel Works, at a place then called Baldwin, and that as soon as he had the converting works ready he, Mr. Lewis, was introduced to him, &c., which led to their intimate acquaintance, and so on, until Mr. Holley had obtained some ingots from Colonel Wright, who had, as Mr. Lewis states, built the Freedom Works, at Lewistown, Pa., and following this it led to these ingots being rolled into rails by Mr. Lewis at the mill of which he was then in charge.

Simply to show that Mr. Lewis is not quite accurate in his recollection of figures, I would state that the records will show that Mr. Holley did not leave the works of John A. Griswold of Troy, N. Y., until January 1, 1867, when he took charge of the Pennsylvania Works, which had been started under the direction of William Butcher of Sheffield, England, and it was in June, 1867, that the Bessemer Works were first started, and that the first blow in the Freedom Works was not made until May 1, 1868, hence it was impossible for any ingots to have been obtained by Mr. Holley from those works before that time, and that preceding it, the steel which had been made at Harrisburg was rolled into rails at the Cambria Iron Works up until May, 1868, by which time the Pennsylvania Steel Works' own rail mill was ready to run.

I have no doubt that Mr. Lewis did assist Mr. Holley in testing some steel by rolling it, but I merely give you the dates above to show you that his recollection as to the accuracy of dates cannot be depended upon.

Referring again to Mr. Lewis taking exception to my saying 1856, when this date ought to be 1858, I would say that I would very gladly give him the two years if I could take it off my life, but unfortunately I have

every evidence that I went to Pottsville in the fall of 1856.

It is true that following the panic of 1857 the works of John Burnish & Co. were idle for a long time, which I assume accounts for Mr. Lewis' mistake as to dates.

Mr. Lewis has played quite an active part in his life, and at one time was quite successful. I believe while he was in charge of the mills at Columbus, Ohio, he took part in politics, and was a member of the Ohio Legislature. Of late years I fear things have not been so prosperous with him, and it is natural that he should feel somewhat bitter, although I am sure I have never, knowingly, injured or slighted him in any way.

If I were to attempt to give you the history of the devices which have been invented but never successfully applied to rolling mills the article would probably be longer than any which I have ever written.

Yours truly,

ROBERT W. HUNT.

CHICAGO, September 11, 1900.

## PERSONAL.

W. E. Corey, superintendent of the Homestead Steel Works of the Carnegie Steel Company, accompanied by a party of Carnegie officials, has gone on a visit to the Lake Superior ore mines.

D. S. Kennedy has been appointed superintendent of the 10, 23 and 30 inch mills of the Homestead Steel Works of the Carnegie Steel Company, at Homestead, Pa., succeeding Wm. A. Corneliuss, resigned.

Myron C. Wick, who is summering at Magnolia Beach, Mass., advises us that it is not true that he sent in his resignation to the Republic Iron & Steel Company as chairman of the Executive Committee, to be acted on at Chicago. It is a fact that Mr. Wick had a talk with some of the officials and advised them to get some one to take his place who could give the company's affairs more time than he was able to do. For this reason it is probable that another chairman of the Executive Committee will be elected before long, but this has not yet been done. Regarding the report that Mr. Wick, in connection with others, would build a plate mill at Youngstown, Ohio, we can state that this is not true. Mr. Wick has never thought of such a move.

A copy of the will of the late W. J. Rainey, deceased, a former coke operator in the Connellsville region, was filed at Uniontown, Pa., last week. Mr. Rainey practically created a trust estate, with his wife and his children as trustees and executors.

Arthur C. Eastwood leaves the Alabama Steel & Ship building Company, Ensley, Ala., to accept the position of engineer with the Electric Controller & Supply Company of Cleveland, Ohio. He will enter upon his new duties at once.

It is probable that Col. J. M. Schoonmaker, now vice-president and general manager of the Pittsburgh & Lake Erie Railroad at Pittsburgh, will be appointed president of the Lake Shore & Michigan Southern Railroad. W. H. Newman, now holding that position, is slated for the presidency of the Southern Pacific, to succeed the late Collis P. Huntington. It will be recalled that Col. J. M. Schoonmaker was for many years president of the J. M. Schoonmaker Coke Company of Pittsburgh, who sold out their interests some years ago to the H. C. Frick Coke Company.

Andrew Carnegie has engaged passage for America on the steamer "Deutschland," sailing from Southampton on Sunday, October 28. Mr. Carnegie is expected to be in Pittsburgh to participate in Founders' Day exercises in that city early in November.

J. H. Gross, superintendent of labor at the Homestead Steel Works of the Carnegie Steel Company, has sailed for Europe as a guest of the company. H. J. Davis, master mechanic at the Homestead Steel Works, who has been abroad about two months as a guest of the company, has returned home.

The departure of J. C. Maloney, formerly superintendent of the wire drawing and nail departments of the Kelly mill at Ironton, was the occasion of the presentation to him by the workmen of a diamond stud.

James B. Dill of New York has returned from Europe.

Marcus Daly, prominently identified with the Amalgamated Copper Company, is ill at New York. He had just returned from Europe.

James Bowron of the Tennessee Coal, Iron & Railroad Company, Birmingham, Ala., has returned after a prolonged tour of industrial Europe.



C. H. Holcomb, who was made president of the Crucible Steel Company of America, has removed his residence from Syracuse, N. Y., to Pittsburgh, and has taken apartments in the Hotel Schenley.

W. R. Lysaght of John Lysaght, Limited, Wolverhampton and Newport, one of the largest sheet manufacturers of the world, is now in this country.

## OBITUARY.

ELISHA TURNER.

Elisha Turner, a prominent manufacturer of Torrington, and well known throughout Connecticut, died on the 13th inst., at his home in that city. He was president of the Turner & Seymour Mfg. Company, president of the Torrington Savings Bank, and a director of the Brooks National Bank. Mr. Turner was a member of the State Legislature in 1868.

JOSEPH SHELLY.

Joseph Shelly, 52 years old, died from heart failure on the 11th inst. Mr. Shelly was well known in the hardware trade as salesman and assistant buyer with H. A. Rogers, 19 John street. Mr. Rogers and Mr. Shelly were clerks in their younger days with Walton Bros., 67 Warren street, who were jobbers of hardware 30 odd years ago. Mr. Shelly then went with Lindsay, Walton & Co., 58 John street, and subsequently to the firm of H. A. Rogers & Co., with whom he had been ever since. Mr. Shelly was of sterling character, and of a genial disposition, which secured for him the respect of a large number of business acquaintances.

**Frederick H. Gliem & Co.**—Fred'k H. Gliem, Jacob E. Gombar and John P. Mathieu have formed a copartnership under the name of Fred'k H. Gliem & Co., and have taken over the business of the late firm of Lucas cutting off machines, floor and tool room boring machine tools and electrical construction work at the old place of business, 1035 and 1037 Ridge avenue, Philadelphia, Pa. Among the tools manufactured by the above company may be mentioned a complete line of cold saw cutting-off machines, floor and tool room boring machines, horizontal boring and milling machines, three spindle horizontal boring machines of special design, &c. They have just delivered two cold saws to the Newbury Mfg. Company, a rotary planer to the Westinghouse Machine Company, and two horizontal boring machines, one to the Waterbury Mfg. Company and one to the Wheeler & Wilson Mfg. Company. They have now in course of erection a number of machines, including several foundry saws and universal cold saws.

An order has been received by the Baldwin Locomotive Works of Philadelphia for 22 heavy freight locomotives for use on the Government railroads of New Zealand. Another order, on which work has just been begun, is for six locomotives for the Rio Tinto Mining Company of Spain. This is a British corporation which is engaged in mining ore. During the past two weeks the firm have shipped to Belgium six locomotives for the Belgian State Railway. Six more are ready to be shipped. The first American made locomotives to be used in Ireland were shipped about two weeks ago. They are the two engines of the English type which are intended for use on the Border & South Coast Railway.

The Shenango Valley will be as brisk as ever as soon as the colder days arrive. The long shut down of many of the plants is thought by business men of the valley to not be without its compensations. The mills have all been thoroughly repaired, hence there is more likelihood of freedom from break downs. Stocks of pig iron and of finished material have had time to get absorbed by the market, and the men have had the entire hot season for rest and recreation. This last feature will result in better work, now that the mills are starting up. There has been a feeling for several years past that the summer shut down was not long enough. In short, a more hopeful tone was scarcely ever before seen in this valley.

The bi-monthly sworn statements of the American Tin Plate Company of average price of shipments of tin plate made in July and August have been submitted to the Amalgamated Association at Pittsburgh. The tin plate workers anticipate that the returns will warrant an advance of 2 per cent. in wages over July and August.

The Cambria Steel Company of Johnstown, Pa., have secured control of 1000 acres of coal land in Salem township in Westmoreland County, Pa., and will open up coal mines on the property.

## The Boiler Manufacturers' Convention.

(By Telegraph.)

CINCINNATI, OHIO, September 18, 1900.—The twelfth annual convention of the American Boiler Makers' Association was called to order this morning at the Grand Hotel by President H. J. Hartley. There were present in the neighborhood of 100 members, some not arriving in time to report at the first meeting. The meeting was first briefly addressed by Mayor Fleishmann of Cincinnati, who welcomed them to the Queen City and invited them to make as much noise as they pleased while they were in possession of the place. He was followed in a likewise brief and pointed manner by William L. Spiegel with an address of welcome on behalf of the local committee. The response on behalf of the visitors was made by Col. E. D. Meier of the Helme Safety Boiler Company, New York. The remainder of the morning session was devoted to the routine work of the organization.

The second session was called to order at 2.30 p.m., and was very largely devoted to the reports of the Executive Committee and the treasurer and secretary. According to the reports offered the association is in a healthy condition financially and has also been increased by the addition of ten new members. The following committees were appointed:

Auditing, James Lappan and George N. Riley, both of Pittsburgh, Pa.

On Time and Place of Next Meeting, Richard Hammond of Buffalo, J. B. Campbell of Akron, Ohio, and E. J. Walsh of Chicago.

The remainder of the session was then devoted to an informal discussion of the following topical subjects:

"The Main Object of the Association; Have Results Been Accomplished?" "The Necessity for Closer Relations." These pertained to the annual meetings of the association. These were followed by a short discussion on "Boiler Manufacturing Business, What it will be, and the Effect of Electricity, Gas and Water Power on the Same."

The meetings for to-morrow (Wednesday) will be an executive session in the forenoon and a discussion on topical questions. There will also be a report of the Committee on Time and Place of Next Convention. In the evening all members and guests are expected to meet promptly at 7.30 for the purpose of attending the fall festival in a body.

Thursday morning's session will be devoted to unfinished business, new business, election of members and election of officers for the coming year. Thursday afternoon will be devoted to a trolley ride about the city in special cars, with a stop at the Zoological Gardens from 5 to 6, thence to Chester Park for dinner, which will be served at the club house.

The large steel interests at Pittsburgh are making heavy shipments of material of all kinds abroad. The Carnegie Steel Company are sending over large quantities of structural material, plates and sheet bars to France, Sweden and Scotland. The Oliver Iron & Steel Company are shipping large quantities of specialties made by that concern, while the recently organized Crucible Steel Company of America are also making shipments of their products to the Continent. Jones & Laughlins, Limited, are sending over large quantities of goods, and have built up a very large trade abroad in cold rolled shafting.

Reports have been given currency in the daily press relative to the acquisition by the American Sheet Steel Company of certain sheet mills owned by the Republic Iron & Steel Company, and of bars by the latter which were controlled by the former. Special reference is made to plants at Sharon and at Canal Dover. This is not news, the arrangement between the two concerns named and the American Steel Hoop Company having been made long ago.

The black plate mills at the Irondale Works of the American Tin Plate Company, at Irondale, Ohio, have been started up.



## Pacific Coast News.

SAN FRANCISCO, CAL., September 10, 1900.—The great event of the week has been the launching of the coast defense vessel, "Wyoming," which took place at the yards of the Union Iron Works in this city at 11.10 a.m., on Saturday last. San Francisco's shipyards have furnished many staunch vessels for the national defense, and the "Wyoming" is the best and latest. It is claimed to be the most formidable vessel of its kind in the world, and certainly its appearance as the great hulk lies on the waters of our bay is calculated to make even the layman believe so. The United States has now become practically a world power, and will need not a few of the vessels of its future fleet on the Pacific, and it is meet and proper that they should be built here. This latest addition to our navy, as she lies red and portentous looking on the water, is a mass of 2,500,000 pounds of steel constructed according to the most improved designs of the naval architect, and, with all her armament aboard, not only capable of giving a good account of any antagonist but also of laying low the proudest city on the Pacific when once her guns had the proper range. She has had two predecessors built at this point—the "Monadnock," at the Mare Island Navy Yard, and the "Monterey" by the same builders. She has yet to receive her armor and her formidable turret with its much more formidable gun. Otherwise she is complete, her armament having been installed before she was launched. Besides this, she carries two 12-inch breech-loading rifled guns, four 4-inch rapid fire guns, three 6-pounders and four 1-pounders. Twelve knots an hour is the speed that she is expected to develop. Her engines are of 2,400 horse-power. Her length is 225 feet, her breadth 50 feet, her depth molded 14 feet 10½ inches. There is ample means provided for her protection, in armor 11 inches thick on the more exposed part, and 5 inches thick on the rest of the vessel where needed. She has thus ample defensive as well as offensive power. The "Wyoming" is of 3200 tons displacement. She is a triumph of both Eastern and Pacific Coast mechanical and constructive skill. Besides this vessel there are under way here three torpedo boat destroyers and the battle ship "Ohio."

To come down to civil life and matters connected with the pursuits of peace, may mention that a large ferry boat for the Atchison, Topeka & Santa Fé Railroad has also been launched. She is 225 feet long and 64 feet broad, with a depth of 17½ feet. She has a horse-power of 2000 and a speed of 15 knots. A novelty in her construction is feathering paddle wheels. They are so built as to feather in either direction according to which end it is intended to run first. This latter vessel is indicative of the fact that San Francisco has now two competing lines of overland railroad and that at no distant day she may have another. The merchants here do not, of course, expect that either line shall run at figures so low that it will be at a loss. They nevertheless think that two roads will bring more business than one and will multiply the points with which business may be done. In fact, there is a very friendly feeling now subsisting between the merchants and the transportation magnates, and each recognizes that the prosperity of the other is essential to his own welfare. The talk at present is that Jim Hill, knowing that the Oriental trade cannot be diverted from San Francisco, is about to add to his railroad property by building a line to this city, to reach it by way of Marysville. In this way he hopes to share in the trade with China, Japan and other Oriental countries and Australia, which is steadily on the increase, and which with the end of the present unpleasantness is bound to assume much larger dimensions than ever.

Trade in hardware and metal is increasing at a very reasonable rate, but in some directions it has gone up by leaps and bounds. I refer now to the demand for supplies connected with the development of the great oil industry of the State. That industry has been developing slowly for the past few years. It has been pursued in a quiet way for a great many years, but for one reason or another did not prosper, and at one time in Southern California there was more than one man connected with it who was looking for a way to get out easily. There was too much competition, and the market was confined principally to the Southern portion of the State. At least it was for the oil produced in the neighborhood of Los Angeles. The price went down below a dollar a barrel, and there was no satisfactory arrangement for transportation to San Francisco. But times have changed. Transportation facilities are being rapidly improved, and though oil is now selling at 85 cents a barrel it is profitable enough to encourage the foundation of company after company, and many of them are paying dividends. The production of oil which, in 1899, was in round numbers 3,000,000 barrels, has now gone up to 9,000,000 barrels a year. At least that is what a very conservative gentleman informed me the other day. His figures were 25,000 barrels a day. There

was as much casing for oil wells sold in the month of August by one firm as in the whole of the three preceding months. And each month this year was not only larger than the same month last year but larger than the preceding month this year. Not alone that, but orders were 30 days behind, with no prospect of improvement in this particular. It was the same in tools for drilling oil wells. Old establishments in the East that had made a specialty of manufacturing these had not at present the capacity to meet the demand, and orders could not be filled for from six to eight weeks. Besides these, which are two of the most important items, there are a large number of articles of hardware needed in this business, and other supplies such as tanks for storing the oil of from 10,000 to 40,000 gallons each. There is going to be quite a demand for these also. And there are pipe lines being established also, for which, of course, pipe is required. Some of these will be many miles in length. The development of the oil fields of the State is interesting from a number of varied points of view. For instance, cheap fuel to the railroads is necessary for cheap transportation. Coal is going up everywhere, and is especially dear on the Pacific Coast, where of late advance has been the order of the day. And it is equally important to our manufacturers. Dear fuel has for the past 30 years been a stumbling block in the way of the California manufacturer, but with abundance of cheap oil at hand it looks as though the problem was about to be solved J. O. L.

## Regulations for Plates for Ship Boilers.

WASHINGTON, D. C., September 18, 1900.—The Supervising Inspector General of Steam Vessels has issued an important series of revised regulations concerning the data to be furnished the Treasury Department by manufacturers of boilers and boiler plate in order that the same may be properly inspected. The new regulations are as follows:

"To manufacturers of boilers and boiler plate:

"Notice is hereby given that the inspection of iron and steel plate under the act of Congress approved January 22, 1894, must be confined exclusively to inspection of iron and steel to be used in the construction of new boilers of steam vessels.

"Manufacturers of boiler plate will hereafter be required to include in their application for inspection of plate at the mills the following information: Name of steamer, if she has one, upon which the boiler is to be used, for which the plate is ordered. If the steamer is not yet named, then the name of builder of hull. For whom built. The waters upon which the steamer is to be navigated. United States local inspection district in which she will be inspected. Number and thickness of plates for shell, steam chimneys, lining of same, shell of steam and mud drums. Thickness of head and side sheets, domes, crowns of furnaces and back connections.

"To insure prompt inspection of their material, manufacturers of boilers for steam vessels should supply the above information when forwarding their orders on a form substantially as follows:

"Order for steel for marine boilers.

"Only such plates as require Government inspection to be shown on this sheet.

"Plates for repairs, or stock boilers will not be inspected at the mills. Material for such repairs will be inspected by the Inspector in districts where the material is to be used.

"All the information called for in table below is positively necessary to the assistant inspector so that he may determine intelligently the exact plates subject to tensile strain in the completed boiler.

"For ..... of ..... 19..

No. of plates.	Material	Diameter heads.	Length.	Width.	Thickness.	Location of plates	Remarks.

"Name of boiler manufacturer,..... at ..... Kind of boiler..... Shop No..... Diameter of boiler. Length of boiler. Steam pressure required. Are heads to be bumped or flat. Name of builder of boat..... Name or number of steamer for which boiler is built..... For whom built..... of ..... Waters upon which steamer is to be navigated..... Tensile strength. Local inspection district in which completed boiler will be inspected.

"The attention of manufacturers of boilers and boiler plate is particularly directed to the requirements in above form, as assistant inspectors at the mills will be justified in refusing to make tests of orders upon failure to give the information called for." W. L. C.

## Carnegie Changes.

(By Telegraph.)

PITTSBURGH, PA., September 19, 1900.—At a meeting of the Board of Directors of the Carnegie Steel Company, held yesterday, the following changes were made: The resignation of A. M. Moreland as secretary and director of the Carnegie Steel Company was accepted, and W. W. Blackburn was appointed to succeed him in both positions. W. C. McCausland, cashier for Carnegie, Phipps Company and the Carnegie Steel Company, Limited, succeeds Mr. Blackburn as assistant treasurer of the Carnegie Steel Company. Frank A. McCune was appointed as cashier to fill the vacancy caused by Mr. McCausland's promotion. The resignation of George Megrew as a purchasing agent of the Carnegie Steel Company was accepted, but his successor was not appointed. C. E. Locke has succeeded George H. Wightman as sales agent of the Carnegie Steel Company at Boston. It is stated that aside from the above no further important changes among officials of the Carnegie interests are contemplated at this time.

**The Largest Springs Ever Made.**—What may be considered a remarkable set of springs has been produced by the Tuthill Spring Company, Chicago. For an auto-truck Mr. Tuthill was called upon to manufacture a set of springs having a capacity of 45,000 pounds. After careful calculation a set of four elliptic and two relief springs of the following dimensions were turned out: Elliptic springs of the highest grade steel,  $3\frac{1}{2}$  inches wide; 18 plates top and bottom; two plates  $\frac{3}{8}$  inches thick, remainder, 5-16 inches;  $41\frac{1}{4}$  inches long, 2 feet high; 1 foot open inside; relief springs of the same material,  $3\frac{1}{2}$  inches wide; one with 20 plates, 14 of which are  $\frac{1}{2}$  inch in thickness; remainder,  $\frac{3}{8}$  inch, making combined thickness  $9\frac{1}{4}$  inches; 47 inches long, inside arch,  $4\frac{1}{2}$  inches; the other relief spring has 28 leaves; combined thickness,  $12\frac{1}{2}$  inches; arch,  $3\frac{1}{2}$  inches. To the practical carriage and wagon maker these dimensions tell a story of a really wonderful set of springs in size and strength.

**The Twentieth Century Exposition.**—Boston is to have an exposition of manufactures in the Mechanics' Building, on a more elaborate scale than those which have annually taken place there. It is under the auspices of the Merchants and Manufacturers' Twentieth Century Exposition, and will open its doors to the public on Monday October 1. It will continue for four weeks.

C. M. Heald, president of the Père Marquette Railway Company, has closed a contract with the American Shipbuilding Company for a steel car ferry to cost \$360,000. The boat will be more powerful than the steamer "Père Marquette," which was built by F. W. Wheeler in 1896, but otherwise she will be a duplicate of that boat, which is said to be the best of her class on the lakes. The new boat will be 338 feet keel, 350 feet over all, 56 beam, and  $36\frac{1}{2}$  feet molded depth. She will have a capacity for 32 cars and, when loaded, she will run at the rate of 14 miles an hour. She will have twin screws and triple expansion engines. Steam will be furnished by four Scotch boilers. The boat will probably be built at the Globe yard in Cleveland. This makes 20 vessels that the American Shipbuilding Company have under contract and is a record for the lakes.

The Electric Controller & Supply Company, Cleveland, Ohio, have entered the field as consulting electrical engineers, and are now prepared to handle work of this class for steel plants, manufacturing establishments, machine shops, &c. They will make a specialty of the remodeling and changing of steam, hydraulic and pneumatic jib and overhead traveling cranes into electric cranes; also are prepared to install complete isolated lighting plants. They will continue the manufacture of their line of controllers, lifting magnets, crane fittings and other electrical specialties.

The new Pittsburgh & Baltimore Coal Company, who are preparing to operate mines on 3000 acres of land south of Irwin, Pa., will be ready to start in a short time. It is said that the company's first order consists of 75,000 bushels of coal for export, and that a special effort for export trade is to be made.

The Washburn Wire Company of Worcester have acquired a controlling interest in the American Electrical

Works, at Phillipsdale, R. I. This announcement was made by President Washburn, who said that the transaction was merely a step in the direction of carrying out the plans adopted by the company. The Phillipsdale concern do a large business in the manufacture of insulated copper wire, and this industry will be continued in the future in connection with the manufacture of high grade steel wire at the plant now being erected directly south of the plant of the American Electrical Works. There will be no change in the name of the old plant under its new management. The American Electrical Works were started by Eugene F. Phillips in 1870, and were incorporated in 1882. The growth of the business was rapid, and from a small concern they have developed into one employing about 800 hands. Their business last year amounted to more than \$4,000,000.

## The Tinning Scale Unsettled.

After a joint conference lasting three days, between representatives of the Tin Plate Workers' Association and the American Tin Plate Company, held in the latter's offices in Battery Park Building, New York City, no settlement of the wage scale for tin house labor was reached. The following joint statement was given out by both sides:

"The conference adjourned without settlement, the American Tin Plate Company having offered a slight advance to tanners and risers, but declining the general advances asked by the Tin Plate Workers' International Protective Association of America. Said association expressed its intention to present the tin plate company's proposition to its several lodges, granting that meanwhile the company were free to pursue such course as they might deem necessary in respect to the operation of some of their tin houses, because independent mills under the control of the Tin Plate Workers' International Protective Association of America were now in operation at last year's scale, the understanding being that such mills are subsequently to be governed by any scale signed by the Tin Plate Workers' International Protective Association of America."

While no settlement of this scale was made, it can be stated that the differences existing are very slight, and that steps are now under way looking to another conference at a very early date, when it is believed the scale will be settled. In the meantime the American Tin Plate Company are starting up some of their black plate mills to accumulate a supply of black plate in anticipation of an early settlement of the tin house scale. Eight black plate mills of the Monongahela Works, in Pittsburgh, were started up on Monday morning.

## MANUFACTURING.

### Iron and Steel.

We have already referred to the fact that the McClintic-Marshall Construction Company, Park Building, Pittsburgh, would build a new plant in the Pittsburgh district. We can now state that the firm have bought a site of 14 acres in Rankin, near the plant of the American Steel & Wire Company, and will put up a works on this property to have a monthly capacity of about 3000 tons of material. The new plant will make structural work of all kinds, and plans as to sizes of buildings, equipment and other details will be arranged as soon as possible. In this connection we can state that this firm, who have been operating the plant of the Pottstown Bridge Works, at Pottstown, Pa., will continue to operate that works right along. The impression that this plant would be abandoned when the new Pittsburgh works are completed is erroneous. The general offices of this concern are now located in Pottstown, but it is probable these will be removed to the Park Building, Pittsburgh, in a short while.

The Carnegie Steel Company of Pittsburgh are making large shipments of steel rails from their Edgar Thomson Works for use in relaying the tracks of the Missouri Pacific between Kansas City and Pueblo. The new rails weigh 75 pounds to the yard and are displacing lighter rails.

The York Rolling Mill, at York, Pa., have posted a notice announcing a reduction in the price per ton for puddling from \$4 to \$3.

The men at the Danville plant of the Reading Iron Company have struck against a reduction of wages.

The puddlers of the plant of the American Car & Foundry Company, at Bloomsburg, Pa., have struck.

We have been officially advised that the Sharon Steel Hoop Company, Sharon, Pa., have applied for a charter of incorporation, with a capital stock of \$200,000. The incorporators are F. H. Buhl, John Stevenson, Jr., Nevin McConnell, D. M. Dela-



mater and James P. Whittia. The new concern will erect a hoop mill for rolling light hoops and cotton ties, and it will be located south of Sharon, Pa., on land adjoining the plant of the Sharon Steel Company. Work on the building of the mill will be commenced at once.

Hamilton Furnace of Ironton, Ohio, has been blown in, after being extensively repaired and overhauled. An additional hot blast stove has been erected, the pumping capacity enlarged and the bosh rebuilt.

A meeting of the stockholders of the Central Plow Steel Company, Limited, of Pittsburgh will be held in the Empire Building, in that city, on September 27, for the purpose of voting upon the question of their renewal or continuance of the company.

The puddling and muck bar mills of the Kittanning Iron & Steel Mfg. Company, Limited, at Kittanning, Pa., have been started up. The concern have entered some large orders for muck bar. Some puddling furnaces in the W. Dewees Wood Works of the American Sheet Steel Company, at McKeesport, Pa., have been started up after a considerable idleness.

All departments of the National Works of the National Tube Company, McKeesport, Pa., are in full operation. This is the largest individual plant owned by the National Tube Company.

Spang, Chalfant & Co., Incorporated, operating the Etna Iron & Tube Works, at Pittsburgh, have commenced work on the erection of a galvanizing plant. Heretofore the firm have had their galvanizing done outside, but in the future will do it themselves.

Hall Furnace of the Republic Iron & Steel Company, at Sharon, Pa., will be blown out the latter part of this month.

The American Steel Hoop Company have given up their lease of the blast furnace at Middlesex, Pa.

#### Machinery.

James McNeill & Brother Company of Pittsburgh have applied for a charter of incorporation. The new company will take over the business of James McNeill & Brother, operating the Vulcan Boiler & Sheet Iron Works in Pittsburgh.

The McMyer Hoisting Works, at Cleveland, are to be removed to Warren, Ohio. To secure the plant the Warren Business Men's Association will sell lots, giving the company 10 acres of ground for a free site.

The National Foundry & Supply Company of Pittsburgh have been chartered, with a nominal capital of \$1000.

The Woolley Foundry & Machine Works, Anderson, Ind., have sold their entire interest, good will and patents in the brick machine business, together with dry pan patterns, to the C. W. Raymond Company, Dayton, Ohio. They have also discontinued the manufacture of drop hammers and other miscellaneous machines, and are confining their work exclusively to the manufacture of gas and gasoline engines, making the Burger engines in two styles, the four-cycle engines in sizes from 15 to 40 horse-power and the two-cycle from 30 to 200 horse-power. This company have been very successful in the manufacture of large size engines of this class, and report a good demand and are making prompt deliveries.

The Frick Company of Waynesboro, Pa., have sold through their Pittsburgh office a 24 x 48 x 60 tandem compound engine to the Pittsburgh Plate Glass Company, at Creighton, Pa.

The foundry of the Thomas D. West Company of Sharpsville, Pa., which has been idle for several weeks, started up again last week.

The L. G. Martin Company of Pittsburgh have been chartered, with a nominal capital of \$5000, and will manufacture gas engines and electrical machinery.

The Frank-Kneeland Company of Pittsburgh, builders of rolling mill machinery and rolls, will build a pattern storage warehouse, 78 x 150 feet, and a large addition to their foundry. The latter will be 50 x 120 feet and will be built out to the Government harbor line of the Allegheny River, the buildings to be supported by piers constructed of iron and concrete. In all there will be five piers, each 40 feet in height. These piers are to have an iron post in the center covered with concrete, making them impervious to the water. The pattern storage warehouse will be three stories high and supported by the same style of piers, each 15 feet apart.

The Standard Scale & Supply Company, Limited, Pittsburgh, whose works are at Bellefonte, Pa., and manufacturers of scales for railroads, mines, mills, warehouses and all purposes, have received an order from the Baltimore & Ohio Railroad for equipping their new grain elevator at South Chicago with ten 1400-bushel hopper scales. These scales are to be equipped with the Reed recording attachment, made exclusively by the Standard Scale & Supply Company, Limited. The concern are now making shipment of 18 1600-bushel scales for the large grain elevators at West Superior, Wis., built by the Great Northern Railway.

Hunt, Helm, Ferris & Co., Harvard, Ill., are preparing to erect a foundry immediately, in connection with their present plant. The dimensions of the foundry will be 40 x 100 feet.

The Detrick & Harvey Machine Company, Baltimore, Md., have been very busy on orders for open sided planers, screw cutting machines and universal horizontal drills, which they make in addition to their regular line of machine tools. Since doubling the size of their plant they have had to run on double turn to keep up with orders. Those on hand now would alone be sufficient to keep them steadily running for several months. The foreign demand for their various machine tools has increased greatly and quite a substantial foreign trade has been built up.

The John Wood Mfg. Company, Conshohocken, Pa., near Philadelphia, have in course of construction a battery of five vertical water tube boilers, 250 horse-power capacity each, and one horizontal water tube boiler, 150 horse-power capacity, for the Roane Iron Company of Rockford, Tenn.

The Norton & Cole Machinery Company, recently incorporated, will assume the business of W. D. Norton at Sixth and Carr streets, Cincinnati, Ohio. O. K. Cole, formerly of Winona, Minn., has taken an interest in the concern and is its treasurer. A \$10,000 addition will be built to the present factory, and the manufacture of flour and corn milling machinery will be added to the present business.

The Welmer Machine Works, Lebanon, Pa., recently received these orders: From the Cherry Valley Iron Company, Leetonia, Ohio, for a 96 x 60 Welmer blowing engine; from the Jones & Laughlins, Limited, Eliza Furnace department, for eight 25-ton hot metal cars; from the Penn Iron & Coal Company, Canal Dover, Ohio, for a 200 cubic foot cinder car, and the Dunbar Furnace Company, Dunbar, Pa., for one 110 cubic foot cinder car.

Wm. Harris & Son, Pittsburgh, Pa., are engaged on several large orders for mine car hitchings, and report that business with them from all points is very good. They have recently added to their equipment a Bement-Miles steam hammer, and are better prepared than ever to take care of any sized order for hitchings.

The National Steel Casting Company of Sharon, Pa., had quite a serious break down a few days ago, and an entire heat, amounting to about 15 tons, was lost.

The National Machinery Company, Tiffin, Ohio, have sold 90 wire nail machines to the Union Steel Company of Pittsburgh, who are building a new plant at Donora, Pa. The same concern have sold 50 wire nail machines to the Belfont Iron Works Company, at Ironton, Ohio.

The Boston Engineering Company have been incorporated in Maine to manufacture and deal in machinery. The capital is \$15,000 and the officers are: President, George H. Barrus; treasurer, George H. Allan.

#### Hardware.

The War Department of the British Government recently conferred an exceptional honor upon the Nicholson File Company of Providence, R. I. Knowing that the War Office of Her Majesty's Government was much pressed for the prompt delivery of supplies for the South African war, the Nicholson Company, acting through its London office, courteously placed its Great Britain stock at the disposal of the Government. A most appreciative acknowledgment was immediately received, and shortly afterward a large order was placed with the Nicholson Company by the War Office for immediate execution. The Nicholson Company are proud of the distinction thus conferred, as the Government of Great Britain does not generally allow the purchase of its departments of supplies made in other countries.

#### Miscellaneous.

The new plant of the Keystone Car Wheel Company, at Hays Station, near Pittsburgh, will be started up this week. Building of the new plant was started about three months ago and it is now completed, and expects to turn out about 330 car wheels per day. A charter was granted to the company on June 7 last, and the officials are C. V. Slocum, president; W. W. Lobdell, vice-president; L. B. Whitney, treasurer, and J. H. Yardley, secretary.

The Pressed Steel Car Company of Pittsburgh have received an order for a number of steel platform cars, with a capacity of 80,000 pounds each, to be used for construction work on the Cape Colony Railroad, South Africa.

The American Bridge Company have taken the contract for the erection of the steel buildings for the large addition to the plant of the Franklin Air Compressor Company, Franklin, Pa.

The statement that the Baltimore Car Works, Baltimore, Md., manufacturers of all classes of railway cars, had received an order for 200 cars from the W. J. Balney Coke Company is untrue.

At Pittsburgh a petition in involuntary bankruptcy has been filed in the United States District Court against the Union Boiler Tube Cleaner Company of Pittsburgh by the Power Publishing Company and McGraw Publishing Company of New York and J. H. Williams & Co. of Brooklyn, N. Y. The claims of the three companies aggregate \$1908.28 for advertising and goods furnished.



## The Iron and Metal Trades.

The Iron markets continue uncertain and reports are conflicting. Those who are nearest to the consumer seem to take the more favorable view of the situation. In the Bar, Sheet and Plate trades, in which, by the way, prices have been low, the volume of orders on the books compare very favorably with those of last year. In the Wire trade business is heavier. One of the Pittsburgh mills of the American Company has been started and there is talk of putting other plants on double turn.

The movement in Pig Iron has been fair. Pittsburgh reports some good sales of off Bessemer Iron for Malleable purposes, with further business pending.

The sudden drop in the price of Scotch warrants is regarded here as merely indicating the end of a squeeze. The small amount of warrants is pretty well controlled. Prices lately have advanced steadily. Settlements are made on the 1st and on the 15th. Saturday last was such a settling day, and on Monday the price dropped back to a normal figure. Little significance need be attached, therefore, to the vagaries of the Scotch warrant market.

In Steel reports of low prices for Billets keep cropping up, but cannot be verified. There is still an unsatisfied export demand. Thus there has been an inquiry in the market for 5000 tons per month from the Scotch Bolt and Nut makers, who are now in an association. Ocean freights continue high, ranging from 17 shillings 6 pence from Baltimore to Rotterdam to as high as 22 shillings for some British ports.

The trade is on the tiptoe of expectation over the coming meeting of the Steel Rail makers and the possibility of an open market is being discussed quietly.

We are advised that a proposal to create an international association for regulating the prices of Merchant Pipe has been declined by the National Tube Company.

The sales of American Skelp to Scotch Pipe manufacturers are not regarded as prejudicial to export movement in Merchant Pipe, since the material is used largely for special purposes and for favorite customers.

The tinning scale and the puddling and Bar rolling scales are still in abeyance, so that now the works have been idle for over two months. It is amazing that the old practice of beginning the annual discussion of the scale only a few days before the expiration of the old agreement still continues. There is no good reason why the Amalgamated Association should not take up the matter in April as well as it does now at the end of June, so that work could be resumed promptly in a manner satisfactory to both parties after a summer shut down of a few weeks in July.

The sensation of the week in the metal trade has been the drop in Tin, which has very materially lowered the price.

In the Spelter industry matters seem to be reaching a climax in the proposed control by purchase of all the leading producers in the country, East and West. One large concern associated with a great consuming interest will certainly stay out, and possibly also one of the older works in the Chicago district. The options expire on October 1.

## A Comparison of Prices.

At date, one week, one month and one year previous.

Advances Over the Previous Month in Heavy Type.  
Declines in Italics.

	Sept. 9, 1900.	Sept. 12, 1900.	Aug. 22, 1900.	Sept. 20, 1899.
<b>PIG IRON:</b>				
Foundry Pig, No 2, Standard, Philadelphia.....	\$15.50	\$15.50	\$16.00	\$22.50
Foundry Pig, No 2, Southern, Cincinnati.....	13.75	13.75	13.75	20.30
Foundry Pig, No 2, Local, Chicago.....	15.00	15.00	15.50	22.00
Bessemer Pig, Pittsburgh.....	14.00	14.00	15.00	23.25
Gray Forge, Pittsburgh.....	13.00	13.60	13.50	21.50
Lake Superior Charcoal, Chicago....	18.50	18.50	20.00	25.00
<b>BILLETS, RAILS, ETC.:</b>				
Steel Billets, Pittsburgh.....	16.75	17.00	18.00	38.00
Steel Billets, Philadelphia.....	19.25	19.50	20.00	41.00
Steel Billets, Chicago.....			20.00	41.00
Wire Rods, Pittsburgh.....	33.00	33.00	35.00	45.00
Steel Rails, Heavy, Eastern Mill....	30.00	30.00	35.00	33.60
Spikes, Tidewater.....	1.50	1.50	1.80	2.50
Splice Bars, Tidewater.....	1.35	1.50	1.50	2.15
<b>OLD MATERIAL:</b>				
O. Steel Rails, Chicago.....	9.50	9.50	9.50	18.50
O. Steel Rails, Philadelphia.....	12.75	12.75	13.00	21.00
O. Iron Rails, Chicago.....	12.50	12.50	12.50	28.00
O. Iron Rails, Philadelphia.....	15.50	14.50	14.00	23.00
O. Car Wheels, Chicago.....	15.00	15.00	15.00	30.00
O. Car Wheels, Philadelphia.....	16.00	17.00	17.00	19.00
Heavy Steel Scrap, Chicago.....	9.00	9.00	9.00	17.50
<b>FINISHED IRON AND STEEL:</b>				
Refined Iron Bars, Philadelphia.....	1.25	1.25	1.30	3.05
Common Iron Bars, Youngstown....	1.25	1.25	1.25	2.10
Steel Bars, Tidewater.....	1.20	1.30	1.30	2.40
Steel Bars, Pittsburgh.....	1.15	1.10	1.05	2.40
Tank Plates, Tidewater.....	1.25	1.25	1.30	3.00
Tank Plates, Pittsburgh.....	1.10	1.10	1.05	2.90
Beams, Tidewater.....	1.65	1.65	1.65	2.40
Beams, Pittsburgh.....	1.50	1.50	1.50	2.25
Angles, Tidewater.....	1.55	1.55	1.55	2.40
Angles, Pittsburgh.....	1.40	1.40	1.40	2.25
Skelp, Grooved Iron, Pittsburgh....	1.40	1.40	1.50	2.25
Skelp, Sheared Iron, Pittsburgh....	1.50	1.50	1.50	2.65
Sheets, No. 27, Chicago.....	3.05	3.05	3.05	3.35
Sheets, No. 27, Pittsburgh.....	2.85	2.85	2.85	3.15
Barb Wire, f.o.b. Pittsburgh.....	2.80	2.80	2.80	3.40
Wire Nails, f.o.b. Pittsburgh.....	2.30	2.20	2.20	2.80
Cut Nails, Mill.....	1.95	1.95	1.95	2.50
<b>METALS:</b>				
Copper, New York.....	16.75	16.75	16.62½	18.50
Spelter, St. Louis.....	3.95	3.90	3.97½	5.40
Lead, New York.....	4.37½	4.37½	4.25	4.60
Lead, St. Louis.....	4.32½	4.32½	4.20	4.52½
Tin, New York.....	29.60	30.37½	30.25	32.00
Antimony, Hallett, New York.....	9.50	9.50	9.50	9.75
Nickel, New York.....	55.00	55.00	55.00	56.00
Tin Plate, Domestic Bessemer, 100 lbs., New York.....	4.84	4.84	4.84	4.82½

### Chicago. (By Telegraph.)

Office of The Iron Age, 1205 Fisher Building, 1  
Chicago, September 19, 1900.

It is evident that in the change from dullness to activity in the Western Iron and Steel markets there is to be, for the present at least, no boom. The markets are perhaps improving, but it is so gradually that the change is hardly perceived. There are said to be some elements of weakness, but some straws that are visible are of the contrary character. Bars are hardening slightly and Plates, both from mill and store, are firmer. There is little activity beyond the immediate needs of consumers, and it is not anticipated that there will be much change in the restricted manner of purchases for the next six weeks. But the volume of buying is pronounced satisfactory, especially when comparisons are made with similar periods in the past. There is from all indications a very fair consumption of material, and orders by wire are about as numerous as at any time recently.

**Pig Iron.**—Some odd lots of Pig Iron, the accumulated products of small Southern furnaces that have gone out of blast indefinitely, products which have been offered in this market at a level below that held by the larger producers, are disappearing. They have apparently been absorbed and have no succeeding lots through which the same low values might be maintained. This fact is giving to the Southern producers a firmer tone, for the larger furnacemen have not changed their prices. Renewed efforts, it is related, are being made to secure from the railroads some concession in freight rates, and hopes of early success are entertained. Northern Irons are no lower locally, the influence of reported reductions in the East not affecting this market. Buyers are interested and there are inquiries for some heavy requirements. The Malleable consumers have not, as a rule, bought for the future, but from the interest shown some large transactions of that kind within a few weeks are not unlikely. Implement makers are in the market for moderate lots, 5000 tons being the highest noted, but the purchases of the past week have been mainly of considerably smaller tonnages. It is said that the average size of orders is increasing, the single carload being frequently succeeded by the 100-ton lot and the latter by 300 or

500. In lots running from 200 to 1000 tons business has been quite good, and the aggregate tonnage thus placed is somewhat larger than for any recent week. Quotations remain as follows:

Lake Superior Charcoal.....	\$18.50 to \$19.00
Local Coke Foundry, No. 1.....	15.50 to 16.00
Local Coke Foundry, No. 2.....	15.00 to 15.50
Local Coke Foundry, No. 3.....	14.50 to 15.00
Local Scotch, No. 1.....	15.50 to 16.00
Ohio Strong Softeners, No. 1.....	17.50 to 18.00
Southern Silvery, according to Silicon..	17.85 to 18.35
Southern Coke, No. 1.....	16.35 to 16.85
Southern Coke, No. 2.....	15.35 to 15.85
Southern Coke, No. 3.....	14.85 to 15.35
Southern Coke, No. 1 Soft.....	16.35 to 16.85
Southern Coke, No. 2 Soft.....	15.35 to 15.85
Foundry Forge.....	14.35 to 14.85
Gray Forge and Mottled.....	13.85 to 14.35
Southern Charcoal Softeners, according to Silicon .....	17.85 to 18.35
Alabama and Georgia Car Wheel.....	20.85 to 21.85
Malleable Bessemer.....	16.00 to 17.00
Standard Bessemer.....	17.50 to 18.00
Jackson County and Kentucky Silvery, 8 per cent. Silicon.....	18.00 to 19.00

**Bars.**—The situation remains somewhat unnatural from the continued silence of the mills of the largest producer of Iron Bar. This fact, doubtless, is tonic in its effects upon the market and among the store trade the remark is commonly heard that stock is scarce and that prices in consequence are firm. Some weak spots are reported, and the size and specifications of an inquiry have much to do with the prices offered. Steel Bars are slightly firmer. Some mills are quoting as high as 1.35c., and are well sold up, but here, too, the attractiveness of the business is influential in establishing the quotation. Current business is mainly of the small lot order, with quite fair aggregate. Iron Bars remain at 1.35c. to 1.40c. From store Common Iron is held at 1.65c.; Steel is 1.50c. to 1.60c., and Hoops higher at 2c. to 2.10c.

**Structural Material.**—No large transactions are reported this week, but the temper of this market is generally commended by sellers. There is good inquiry, and for next season's needs a heavy tonnage is in prospect. In a small way current orders denote a good, healthy consumption throughout the smaller cities of the West. Prices are firm. Quotations, mill shipments, are as follows: Beams, Channels and Zees, 15 inches and under, 1.65c.; 18 inches and over, 1.75c.; Angles, 3 inches and over, 1.55c.; Angles, under 3 inches, 1.35c.; Tees, 1.70c.; Universal Plates, 1.35c. From local yards small lots of Beams and Channels quoted 2.15c. to 2.35c.; Angles, 1.80c. to 1.90c. rates, and Tees, 2c. to 2.20c.

**Plates.**—From store demand has improved. It is not yet so much that buyers are convinced that a turn has come, as that pressing needs force the buying. Consuming manufacturers, however, are meeting with a stability or a strength of quotations that induces a most careful consideration of the situation, and there are some large inquiries in the market as a result. From mill Tank Plates are quoted at 1.30c. to 1.35c., and Flange 1.60c. to 1.70c. From store Tank is quoted at 1.55c. to 1.65c., and Flange 1.90c. to 2c.

**Merchant Pipe.**—Business is running along in a moderate way, buyers quite commonly consuming generous stocks bought in August. Prices are unchanged. Manufacturers' prices, random lengths, are as follows:

	In carloads	Less than carloads.
	Bk. Galvd.	Bk. Galvd.
1/4 to 1/2 inch and 11 to 12 inches.....	59.2 46.2	54.9 40.9
3/4 to 10 inches.....	66.7 53.9	61.9 48.9

**Sheets.**—There is uncertainty in prices this week in a small way, and while some interests are holding to quotations there are reports of fresh concessions by others. The amount of business is fairly good, and large consumers are in the market for heavy requirements. From store Common No. 27 is quoted at 3.10c. to 3.15c.; Nos. 10 to 14, 1.80c. to 2c., and No. 16, 2.10c. to 2.20c. Galvanized is 70 and 5 to 70 and 10.

**Merchant Steel.**—A few belated inquiries for good sized lots keep coming into the market, but the main trade of the season seems to have been closed. One large producer reports more business booked than at this time last year. Prices are without change. Mill shipments, Chicago delivery, are quoted as follows: Smooth Finished Machinery Steel, 1.80c. to 2c.; Smooth Finished Tire, 1.80c. to 2c.; Open Hearth Spring Steel, 2.25c. to 2.50c.; Toe Calk, 2.50c. to 2.75c.; Sleigh Shoe, 1.75c. to 2c.; Cutter Shoes, 2.50c. to 2.75c.; Ordinary Tool Steel, 7c to 7 1/2c.; Special, 13c. and upward.

**Rails and Track Supplies.**—Pending the meeting announced to be held in New York this week to consider prices for the coming season, the Western market for Rails is quiet. An adjustment of values is anticipated within a few weeks on business for next year's deliveries. Current quotations on Rails are nominally unchanged. Standard Sections are \$35, and Light Rails

\$27 to \$30. Splice Bars are 1.40c. to 1.50c.; Spikes, 1.70c. to 1.80c.; Bolts, with Hexagon Nuts, 2.10c. to 2.20c.; Square Nuts, 2c. to 2.10c.

**Old Material.**—The delay in renewed buying of Old Material by large consuming interests is longer than anticipated by some holders, and there is a slightly greater tendency to unload. Railroads keep offering their current production freely, and the existing offerings are enough in excess of needs to give the market the appearance of weakness in spots. Some transactions are reported at prices below quotations, but the general market is waiting and gives no conclusive evidence as to levels when activity reappears. The following are approximate quotations per gross ton:

Old Iron Rails.....	\$12.50 to \$13.00
Old Steel Rails, mixed lengths.....	9.50 to 10.00
Old Steel Rails, long lengths.....	10.50 to 11.00
Relaying Rails.....	22.00 to 23.00
Old Car Wheels.....	15.00 to 15.50
Heavy Melting Steel Scrap.....	9.00 to 10.00
Mixed Steel.....	8.00 to 9.00
Iron Fish Plates.....	11.50 to 12.00
Steel or mixed do.....	10.00 to 11.00
Iron Car Axles.....	15.00 to 15.50
Steel Car Axles.....	14.00 to 14.50
No. 1 Railroad Wrought.....	11.50 to 12.00
No. 2 Railroad Wrought.....	10.00 to 10.50
Shafting, Iron and Soft Steel.....	15.00 to 16.00
No. 1 Wrought.....	9.00 to 9.50
No. 1 Country Wrought.....	8.00 to 8.50
No. 1 Mill.....	7.00 to 7.50
No. 2 Mill.....	5.50 to 6.00
No. 1 Busheling.....	8.00 to 8.50
No. 2 Busheling.....	7.00 to 7.50
Iron Car Axle Turnings.....	8.00 to 8.50
Soft Steel Axle Turnings.....	7.00 to 8.00
Machine Shop Turnings.....	6.50 to 7.00
Wrought Drillings.....	6.00 to 6.50
Cast Borings.....	4.00 to 4.50
Mixed Borings and Turnings.....	4.00 to 5.00
No. 1 Bolders, cut.....	8.50 to 9.00
No. 2 Bolders, cut.....	6.00 to 6.50
Boller and Ship Scrap.....	8.00 to 8.50
No. 1 Cast.....	10.00 to 11.00
No. 2 Cast.....	7.00 to 8.00
Railroad Malleable Cast.....	10.00 to 10.50
Agricultural Malleable Cast.....	9.00 to 9.50

**Metals.**—There is good inquiry for Copper for future requirements, with prices firm. Lead is in moderate demand and prices are unchanged. Lake is quoted 17c., and Casting, 16 3/4c. Lead has advanced to 4.32 1/2c. for Desilverized and 4.42 1/2c. for Corroding in 50-ton lots.

## Philadelphia.

Office of The Iron Age, Forrest Building, 1  
PHILADELPHIA, PA., September 18, 1900.

There is very little change to note in the Iron and Steel markets, so far as regards this vicinity. Business is satisfactory in volume, and fairly so as regards prices, inasmuch as they are steady, and have lost the semi-panic feeling which prevailed some time ago. Considering the near approach of the elections, the coal strike, and other disturbing influences, the situation is better than might be expected, but there is no buoyancy, and very little disposition to enter into extended engagements. The curtailment in output during the past eight or ten weeks has, however, kept stocks in moderately good shape, and in that respect the market is in a healthy condition. Nevertheless there is a feeling that business will be of a limited character until after the election, that is to say, it will be limited to early requirements, as there is no disposition to make heavy commitments until this question is definitely settled. Meanwhile there is a good export demand, and as order books for the home trade are also pretty well filled, it is believed that the next six or eight weeks can be gone through without any material change in prices.

**Pig Iron.**—The market is somewhat stubborn. Prices cannot be worked upward, and it is equally difficult to work them down on such business as is offered. If buyers could be found for large lots covering three or four months for delivery, some holders would be willing to discount prices to a greater or lesser extent, but as very few offers of that kind are presented, it is not thought worth while to deviate from last week's prices. The current demand is very fair, however, and if makers had any assurance that it would be continued they would probably be less urgent to sell, but it is evident that at present prices there is not likely to be any scarcity of material. Sales of Basic and some of low grade Iron have been made, prices being relatively lower than those of standard quality, \$14 having been accepted for Basic, and \$13.50 to \$14 for fair qualities of Forge Iron. No. 2 X Foundry commands anywhere from \$15.50 to \$16.25, according to what the Iron is, what quantity, and what point for delivery. Some holders decline to meet these figures, but most of the business done is at prices within the limits named, and in a few instances even lower rates have been accepted. A fair average range for Philadelphia or nearby points would be about as fol-



lows: No. 1 X Foundry, \$17 to \$17.50; No. 2X Foundry, \$15.50 to \$16.25; No. 2 Plain, \$15 to \$15.25; Mill Irons, \$14 to \$14.50; Ordinary, \$13.50 to \$14; Basic, \$14 to \$14.50; Bessemer, \$15 to \$16; Low Phosphorus, \$24 to \$25.

**Billets.**—Prices are nominally \$19.50 to \$20.50, but only small lots are taken, the general disposition being to keep as close in shore as circumstances will permit.

**Plates.**—The large line of business which was taken in last week appears to have in a measure exhausted the demand for big lots, but there is a good run of orders from the smaller consumers, so that the market has quite a cheerful aspect. The leading mills are now well filled up, and the prospect for full time during the winter months is very encouraging. Prices are steady as last quoted: Plates,  $\frac{1}{4}$  inch and thicker, 1.25c. to 1.30c.; Universals, 1.30c. to 1.35c.; Shell, 1.35c. to 1.40c.; Flange, 1.50c. to 1.60c.; Charcoal Iron Plates, C. H. No. 1, 2.25c.; Best Flange, 2.75c.; Fire Box, 3.25c.

**Structural Material.**—The market is a little quiet as regards new business, but as a rule mills have a great deal of work on their books, particularly for bridge building. There is also a considerable demand from the shipyards, which is likely to continue, as a great deal of new business is expected in the near future and during all the winter months. Prices as follows: Beams and Channels, 15-inch and under, 1.60c. to 1.65c.; Angles, 3 to 6 inches, 1.30c. to 1.40c.

**Bars.**—There is a fair demand for Bars, but prices are not quite as strong as they were a week ago. Plenty of business could be had at 1.25c., delivered, but after making sales at that figure f.o.b., makers are not disposed to take any back tracks until they are forced to do so. The situation is a little complicated by the labor question, however, and both buyers and consumers are at a loss to know how the market will be affected. If the matter is settled and the mills start up to any extent, it is believed that the supply will be in excess of the demand, while any protracted disagreement might cause scarcity and higher prices. Steel Bars, however, are in good supply, and are an effectual barrier to much of an advance in Iron Bars. Prices to-day are about 1.30c. to 1.35c., delivered, for best Refined Iron, and 1.20c. to 1.25c. for Steel Bars.

**Sheets.**—The demand for thin Sheets continues without abatement, and mills are crowded with work of this class. The low numbers are neglected, and are therefore relatively easier in prices, general quotations for best makes being as follows (common Sheets two-tenths less): No. 10, 2.25c.; No. 14, 2.35c.; No. 16, 2.50c.; Nos. 18-20, 3c.; Nos. 21-24, 3.10c.; Nos. 26, 27, 3.20c.; No. 28, 3.30c.

**Old Material.**—The demand is a little slow on account of the uncertainty in regard to labor at the Bar mills. Sometimes an extra good price can be had for material that happens to be wanted, but ordinarily bids and offers are about as follows for deliveries in buyers' yards: Choice Railroad Scrap, \$14.50 to \$15.50; No. 1 Yard Scrap, \$11.50 to \$12.50; No. 2 Light Scrap, \$10.50 to \$11; Machinery Cast, \$14.50 to \$15; Heavy Steel Scrap, \$11.75 to \$12.50; Old Iron Rails, \$15.50 to \$16.50; Old Steel Rails, \$12.75 to \$13.50; Wrought Turnings, \$8.50 to \$9; Cast Borings, \$6.75 to \$7; Old Car Wheels, \$16 to \$18; Iron Axles, \$15 to \$16; Steel Axles, \$15 to \$16.

Potts & Leaf, 220 South Fourth street, Coal and Iron merchants, announce that they have associated with them N. B. Wittman as a partner, under the firm name of Potts, Leaf & Wittman. Mr. Wittman was formerly president of the Danville Bessemer Company, and prior to that of the blast furnace of the E. & G. Brooke Iron Company, Birdsboro.

## Pittsburgh.

Office of *The Iron Age*, Hamilton Building, 1  
Pittsburgh, September 19, 1900. (

(By Telegraph.)

**Pig Iron.**—The Eastern Malleable Association are reported to have bought about 12,000 tons of Malleable Bessemer Iron for extended delivery, at a price equal to about \$11.50 to \$12 at furnace. The order was divided among several interests. This Iron is practically an off Bessemer, the sulphur running up to 0.05, but the phosphorus running up as high as 0.16 to 0.17 per cent. There is also an inquiry in the market for a round lot of Low Phosphorus Bessemer Iron, which is expected to be placed this week. One other interest is inquiring for 5000 to 6000 tons more of Malleable Bessemer Iron.

Aside from the above there has been nothing done, only an occasional small lot of Standard Bessemer being sold on the basis of \$14, Pittsburgh, and there is a little better demand. Foundry Iron is also in better demand, but prices are low and show no improvement. We quote Standard Bessemer Iron at \$14. Local Gray Forge, \$13; Standard No. 2 Foundry, \$13.75 to \$14, all f.o.b. Pittsburgh.

**Billets.**—Inquiries are in the market from Eastern mills for several thousand tons of Billets, but so far none of this business has been taken by local mills. In fact very little Steel has been sold by Pittsburgh mills for some time. The nominal price of Billets is \$17 to \$17.50, Pittsburgh, but we have not heard of any sales for some time.

**Sheet Bars.**—We continue to quote Long Bars at \$21 and Light Tin Bars at \$22.50 to \$23, Pittsburgh. It is stated that the price of \$21, Pittsburgh, for Long Bars has been shaded.

**Muck Bars.**—The long shut down of so many mills rolling Muck Bars has caused something of a scarcity, and for this reason high prices are being obtained. We can note a sale of 500 tons of Standard Muck Bars at \$25.50, delivered, Pittsburgh.

(By Mail.)

There is nothing of special interest to note in the Iron Trade this week. The better demand for Finished Material, referred to in these reports before, continues, and the market on Bars, Plates, Skelp and Pipe is active and prices firm. There is a good deal of inquiry for Malleable Bessemer Iron, and one interest has bought about 12,000 tons at a low price. Steel is quiet, and is nominally \$17.50, Pittsburgh, with reports of small sales at lower prices. The Tin Plate scale has not yet been arranged, but will probably be fixed at a meeting to be held the last of this week. It is also likely an arrangement will be made between the Amalgamated Association and Republic Iron & Steel Company and American Steel Hoop Company, by which the idle mills of the two concerns can be started. A conference is now going on between committees at Youngstown.

**Ferromanganese.**—There is very little demand. We quote 80 per cent. domestic Ferro at \$85, delivered.

**Plates.**—There is a fair general demand for Plates, and the tone of the market is strong. A good deal of work is in sight, and the leading mills are pretty well filled up. We quote Tank quality,  $\frac{1}{4}$ -inch and heavier, at 1.15c., but on a very nice specification it is probable 1.10c. could be done. We quote Shell at 1.25c.; Flange, 1.35c.; Fire Box, 1.50c. for medium quality, 1.75c. to 2c. for best quality.

**Structural Material.**—The American Bridge Company have taken a contract for the Kura Arsenal, in Japan. It will require from 3000 to 3500 tons of material, which will be supplied by Carnegie Steel Company. There is a very large tonnage being placed, made up mostly, however, of small jobs. The Structural mills are all pretty full of work, and the outlook is very good. Prices are unchanged and we quote: Beams and Channels, up to 15-inch, 1.50c.; over 15-inch, 1.60c.; Angles, 3 to 6 inches, inclusive, 1.40c.; over 6 inches, 1.50c.; under 3 inches, 1.25c.; Zees, 1.50c.; Tees, 1.55c.; Bars, 1.10c. to 1.15c.; Universal and Sheared Plates, 1.10c. to 1.15c., all f.o.b. Pittsburgh.

**Sheets.**—We continue to note an active demand for Sheets, and the market is firm. We quote No. 27 Black Sheets, box annealed, one pass through cold rolls, at 2.85c.; No. 28, 2.95c. For very desirable orders it is probable these prices might be shaded about \$1 a ton. We quote Galvanized Sheets at 75 per cent. off, maker's mill. For small lots, 70, 10 and 2½ per cent., with 15 cents freight, is quoted.

**Bars.**—There continues to be an active demand for Bars, and the market is strong. Several of the leading local mills now quote 1.15c., minimum, for Steel Bars at mill. The general market is 1.15c. to 1.20c., depending on the order. We quote Common Iron Bars at 1.25c., at Valley or Eastern mill. High grade Bars, made by local mills, are quoted at 1.70c. to 1.75c. at mill.

**Steel Rails.**—A very important meeting of the Rail interests is to be held in New York on Thursday of this week. At this meeting the question of prices of Rails for next year will come up and will probably be fixed. The price of Steel Rails, Standard Sections, for months has been nominally \$35, but there have been no sales at



that price. Prices on Light Rails are not governed by the Rail pool, and these have been sold right along at very much less than the nominal price of Standard Sections. It is expected that some of the leading roads will come into the market before long for their requirements of Rails for next year, and it is desired to get a price fixed as soon as possible. In some quarters the impression prevails that \$22, Pittsburgh, may be agreed upon.

**Merchant Steel.**—Demand is reported to be slightly better, and on certain kinds of material prices are firmer. We quote Tire Steel at 1.25c. in carloads and 1.35c. in small lots. Open Hearth Spring, 1.60c. to 1.75c. in small lots; Toe Calk, 1.60c., half extras; Hammered Lay Steel, 4c.; Rolled Lay Steel, 3c.; Cold Rolled Shafting, 60 and 10 per cent. off in carloads; Tool Steel, 7c. and upward, depending on quality. On Tool Steel in lots of 500 pounds and over freight is allowed east of the Mississippi River. Terms are 60 days, 2 per cent. off for cash in 10 days.

**Iron and Steel Skelp.**—Several of the Eastern Pipe mills are in the market for round lots of Skelp, and there is a good deal of inquiry. We quote Grooved and Sheared Iron Skelp at 1.40c. to 1.50c., f.o.b. Pittsburgh. We quote Grooved and Sheared Steel Skelp at 1.30c. to 1.35c., delivered, buyer's mill.

**Tubular Goods.**—We can report a continued active demand for Tubular Goods from all over the country, but demand for Merchant Pipe is not quite as large now as it was at the first of the month. There is a particularly heavy business being placed in oil country goods, as it is desired to get as much Pipe laid before the ground freezes up as possible. Some good orders for Line Pipe are also being placed, while foreign trade in Tubular Goods is large and showing increase right along. Prices on Pipe are stronger than they have been for months, and there is very little, if any, cutting being done on established prices. There has been a slight advance in Charcoal Iron Tubes. Prices to consumers in carload lots are as follows:

Merchant Pipe.			
	Black. Per cent.	Galvd. Per cent.	
$\frac{1}{8}$ to $\frac{1}{2}$ inch and 11 and 12 inch.....	61	48	
$\frac{3}{4}$ to 10 inch.....	68½	56	
Casing, Random Lengths.			
	S. & S.	I. J.	
2 to 3 inch.....	55	48	
3¼ to 4 inch.....	60	56	
4¼ to 12½ inch.....	65	61	
Casing, Cut Lengths.			
	S. & S.	I. J.	
2 to 3 inch.....	50	42½	
3¼ to 4 inch.....	56	51½	
4¼ to 12½ inch.....	61½	57	
Boiler Tubes.			
	Up to 22 feet. Per cent.	22 feet and over. Per cent.	
Steel.			
1 inch to 1½ inch and 2½ inch....	49½	44½	
1½ to 2¼ inch.....	45	39½	
2¼ to 18 inch.....	37	52½	
Iron.			
1 inch to 1½ inch and 2½ inch....	53	49	
1½ inch to 2¼ inch.....	49	44	
2¼ inch to 18 inch.....	60	55	
Charcoal Iron.			
	22 feet and under.	22 feet and over.	
1 to 1½ and 2½ inch.....	49½	44½	
1½ to 2¼ inch.....	45	39½	
2¼ to 18 inch.....	57	52½	

**Iron and Steel Scrap.**—The Scrap market continues very dull, and it is difficult to quote prices, as there is so little doing. However, some improvement in demand is expected before long, in view of the fact that the idle mills of the Republic Iron & Steel Company and American Steel Hoop Company are expected to get started within a few days. These two concerns are the largest buyers of Scrap, and as their mills have been idle since June 30 they have both been practically out of the market since that time. We quote as follows: No. 1 Railroad Wrought Scrap, \$12 to \$12.50 net ton; Old Iron Rails, \$15 gross ton; Old Steel Rails, \$11 to \$11.50 gross ton; Cast Iron Borings, \$6 to \$6.50; Turnings, \$7 to \$7.50 gross ton; Soft Steel Busheling Scrap, \$11.50 to \$12 gross ton; Tank and Pipe Scrap, Sheared, \$11 to \$11.50 gross ton; Old Horseshoes, \$12 net ton.

**Connellsville Coke.**—A few more ovens in the Connellsville region have been started up, slightly increasing output. Last week, out of 20,433 ovens in the Connellsville region, 13,815 were active and 6,618 idle, the output having been 154,748 tons. We quote strictly Connellsville Furnace Coke at \$2 a ton, but there are reports that slightly lower prices are being made. We quote Furnace Coke at \$2.25 to \$2.50 a ton. Outside Coke is being offered at much lower prices.

The offices of Joseph Dreifus, dealer in Iron and Steel Scrap, have been removed from Monongahela National Bank Building, Pittsburgh, to his own yard, corner South avenue and Walker street, Allegheny, Pa.

## Cleveland.

CLEVELAND, OHIO, September 18, 1900.

**Iron Ore.**—The chief interest in the Iron Ore market is centered in the prospects for the future. During the months of November and December of last year the sale of Iron Ore amounted to about 18,000,000 tons. Business was practically suspended then until the middle of January, when the Ore Association, with headquarters in Cleveland, met and fixed the prices at which future sales should be made. The basing prices were, on old range Ores, \$5.50 for Bessemer and \$4.15 for non-Bessemer. It soon developed that if the Ore men wished to sell any more Ore they must reduce the prices; refusing to do which, the business came to a standstill and practically no Ore has been sold since. It has been expected that the middle of September or October 1 at the latest would bring out a demand for more Ore than had already been sold, and in order to provide for this business the Ore men at another meeting the latter part of June reaffirmed the prices made in the spring, to cover business for the latter half of the year. If any sales are to be made now, therefore, they will be on the basis quoted. Conditions now are such as to warrant the belief that but little more Ore will be sold before the close of the season of navigation. Iron Ore producers expect to hold firmly by the association prices on the old range Ores. On Mesaba the prices vary considerably, as there is no agreement concerning them. Biwabik continues to be quoted at \$4.25 and Adams at \$4.85, although but little if anything is being done with them. Since the two charters were made at 65c. from Duluth and Ashland recently no wild boats have been placed for Ore, which is an indicator of the dullness of the market. The furnaces are not consuming much Ore just now; hence all that is brought down the lakes must be placed on the docks. While these are not seriously congested as yet, the situation is such that the movement to the stock piles of the furnaces must begin soon or the movement down the lakes must be, in a degree, curtailed.

**Finished Material.**—A general improvement is seen in the conditions surrounding the Finished Material market. The prices on Ship Plate, and, in fact, on all Plates, are stiffer than they have been. It might now be said that 1.20c. is an absolute minimum on Plates. There is no big business in sight now, although a car ferry for the Père Marquette Railroad has just been ordered from the American Ship Building Company, for which Plates will be needed soon. The market has heard of two or three other boats that are being figured on, and it is expected that the order will be placed soon. There is a good demand for Plates now, but the amounts are small. Bars also show up stronger than they have been. The prices quoted this week show 1.15c. as rock bottom, with most of the quotations being about 1.20c., or even better than that. There is probably a larger demand for Bars now than any other grade of Finished Steel, and the sales are quite heavy. There is a slight tendency among contractors to buy in Shapes while the prices are low, but this is not extensive, the preference being to wait until the business develops before covering. From what can be learned a large tonnage is in sight for the first of the year. The demand for Billets is just moderate, and, as far as can be learned, the prices are holding firm.

**Old Iron.**—With most of the rolling mills closed down on account of the strike the demand for Scrap has been light. The sales have not been heavy enough, in fact, to permit of any quotation which would be an adequate one.

## Cincinnati. (By Telegraph.)

Office of *The Iron Age*, Fifth and Main streets, 1  
CINCINNATI, September 19, 1900.

There is but little change to report in the general condition of the Pig Iron market at this point. Northern Irons, being comparatively lower than the product of the Southern furnaces, are almost monopolizing what trade there is going. The total tonnage booked for all classes of stock is, of course, not at all large, though it is much nearer a normal volume than for months past. There is nothing doing in Mill Iron, and buyers of other kinds are ordering only in small quantities. Ideas, as values, vary greatly, more than is shown by the range given in the quotations herewith, though of course nearly all the trading is being done on the minimum basis. The low figures must be understood as relating only to lots for prompt shipments and sellers say they cannot contract for any distance ahead on that basis. The market is quiet and fairly firm, and bids fair to remain so for the present. Freight rate from Birmingham is \$3.25 to this

point; from the Hanging Rock district, \$1. We quote, f.o.b. Cincinnati:

Southern Coke, No. 1.....	\$14.75 to \$15.25
Southern Coke, No. 2.....	13.75 to 14.25
Southern Coke, No. 3.....	13.00 to 13.50
Southern Coke, No. 4.....	12.50 to 13.00
Southern Coke, No. 1 Soft.....	14.75 to 15.25
Southern Coke, No. 2 Soft.....	13.75 to 14.25
Southern Coke, Gray Forge.....	12.00 to 12.75
Southern Coke Mottled.....	12.00 to 12.75
Ohio Silvery, No. 1.....	18.25 to 18.75
Ohio Silvery, No. 2.....	17.25 to 17.75
Lake Superior Coke, No. 1.....	15.00 to 15.50
Lake Superior Coke, No. 2.....	14.00 to 14.50
Lake Superior Coke, No. 3.....	13.00 to 13.50

#### Car Wheel and Malleable Irons.

Standard Southern Car Wheel, chilling grades.....	\$22.00 to \$22.50
Standard Southern Car Wheel, No. 2.....	21.25 to 21.75
Lake Superior Car Wheel and Malleable.....	19.00 to 20.00

**Plates and Bars.**—The local market is very quiet, though prices as given last week are being strongly maintained. No business of much moment is looked for at an early date. We quote, f.o.b. Cincinnati: Iron Bars, carload lots, 1.60c., with half extras; in small lots, 2c., with full extras; Bar Steel, carload lots, 1.70c., with half extras; small lots, 2c., with full extras; Iron Bar Angles, 1½ x 3-16 and larger, in car lots, 1.75c.; small, 2.25c.; Sheets, No. 10, 2.25c.; No. 27, Steel, 3c.; Plates, 2c. to 2.25c.

## Birmingham.

BIRMINGHAM, ALA., September 17, 1900.

The old saying, "Hope deferred maketh the heart sick," applies to the attitude of the sellers of Iron in this district. In last letter the situation was represented as an improved one, and the way seemed to be clearing for a good, steady, healthy market. It was all true, and the week closed with the holders of Iron in better spirits. But the promise of a better market was a disappointing one. While the market was quoted on the basis of \$11 for No. 2 Foundry, at which figure (and above) sales were being made, one interest entered the market and quietly landed No. 2 Foundry Iron at \$10, advancing price late in the week to \$10.50. Some people think this action put a quietus to the fresh buying that was springing up. That week, as reported to you, No. 3 Foundry sold for export at \$11. What kind of a market is it where, in the same week, No. 3 Foundry sells at \$11 to foreign buyers and No. 2 Foundry goes at \$10 to domestic trade? The inference is that the West got the \$10 Iron, as it could not be placed there save at about that basis.

The past week has been one of unusual quietude among the domestic trade, and as to prices, reliable information concerning them reaches us through channels in the buying markets. It is useless to quote them here, even as approximately correct. Uneasiness as to the course of the market is encouraged by the fact that when a hardening tendency is manifested there comes a "presto, change," and an anchoring back to previous values. Opinion is fast settling to the conclusion that we will have a "see-saw" market until the Presidential election definitely declares the coming policy of the Government. The forecasting of the market under present conditions reminds one that "fools rush in where angels fear to tread."

The orders, both from domestic and foreign sources, for the Steel mill products have so materially improved that its capacity will be increased and more of the furnaces put in operation. Mention was made of the shipment some time ago of sample lots of Billets and Ingots to foreign ports. It was "seed sowed in good ground" and has borne good fruit, for good orders have been received from the ports of consignment. These orders cover material that the mill prefers to turn out, and at prices that are very satisfactory to the management. One order was for 1200 tons. There was another order under consideration at the close of the week for 5000 tons. Its acceptance depended altogether upon a satisfactory arrangement as to freight.

As to the export trade, inquiry was fair and some little was done. But room is so scarce just now, and rates so irregular and so high, that getting in is pretty much a matter of luck. At one time here the past week there was a difference of \$1 per ton between rival interests in freight rate to the same European port. Agents, as a rule, are independent as to rates, and outgoing Iron is taxed all the freight money it will bear.

The same can be said of the action of the railroads toward the domestic trade. When Iron had its great advance the roads that hauled it claimed their share and marked an advance in rates. It was cheerfully conceded. Now that Iron is back to its old level of prices the parties interested claim a concession in freight rates to equalize matters. So far the railroads have declined to recognize the claim as having any equity to it. It is relegated by them, with other claims they are slow to allow, for fur-

ther consideration and decision at a meeting to be held "at 4 o'clock next fall." This is the darky's way of side-tracking a question his interests oppose. But the question is one that, like "Banquo's ghost," "will not down." A persistence in their course will continue to prevent entrance into the Western markets and deprive them of the tonnage that otherwise would be theirs. The trouble mentioned between the Central Foundry Company and their Pipe force has been adjusted, and there is no difference now anywhere in the district between capital and labor.

The preliminaries to some large trades in Ore and Coal properties are being conducted. In some instances a hesitation is induced by the nearness of the Presidential election. But the attention of capital to the inducements and opportunities offered by the district seems to be freshly aroused, and there is much investigation going on concerning properties listed as investment properties. From sources that have unquestioned advantages for correct and reliable information upon the subject, it is learned that capital (mainly from the East) counting up into the hundreds and hundreds of thousands of dollars is only waiting the assurance of safety of investment to turn it loose in this district "for value received."

## St. Louis. (By Telegraph.)

Office of The Iron Age, 1205 Chemical Building, }  
St. Louis, September 19, 1900. }

**Pig Iron.**—There is some improvement in buying and greater inquiry is also noted. The tonnage involved in each case is generally of carload or 100-ton character. Several exceptions are to be mentioned in which the sales figured from 400 to 500 tons. Buyers are necessarily attending to current supplies, but so far as known no willingness exists to enter into engagements extending beyond December. Prices to-day have reached the lowest level since April, 1899, so far as Southern Irons are concerned. Special Irons are quoted in this market to-day as follows: Bessemer Pig, \$17.25; Ohio Strong Softener, No. 1, \$16.75; ditto No. 2, \$16.25; Silicon, 8 per cent., \$22.25; Car Wheel Charcoal Irons, from \$21.75 to \$22.75. There is to be another meeting this week between Southern producers and the interested roads, at which the producers hope to obtain a reduction in the prevailing freight rates, the Birmingham to St. Louis rate being \$3.75 to-day. Prices below show a 25c. difference as between No. 1 Foundry and Soft. It is claimed that it is justified through the limited supply of Foundry grades. We quote, f.o.b. cars St. Louis:

Southern, No. 1 Foundry.....	\$15.50 to \$16.00
Southern, No. 2 Foundry.....	14.50 to 15.00
Southern, No. 3 Foundry.....	13.50 to 14.00
No. 1 Soft.....	15.25 to 15.75
No. 2 Soft.....	14.50 to 15.00
Gray Forge.....	12.75 to 13.25

**Bars.**—The trade is more inclined to the opinion that the bottom has been reached in prices. Mills are stiffening and some of the principal producers are asking advances of from \$1 to \$2 per ton. Stocks on hand at jobbers' are in more active movement, although consumers are taking weekly requirements rather than needs for several months. Mill prices for heavy tonnage range from 1.30c. to 1.40c. for Steel; Iron, 1.45c. to 1.50c. Jobbers quote carloads from mill at 1.65c., full extras, for Steel; smaller lots of Steel and Iron range from 1.75c. to 1.90c., full extras.

**Rails and Track Supplies.**—The floods in the South have occasioned some extra buying. Many nearby roads are also now laying Rails bought months ago. The demand for Track Supplies is rather better than usual. We quote Steel Splice Bars, 1.85c. to 1.90c.; Track Bolts with Square Nuts, 2.25c.; with Hexagon Nuts, 2.35c.; Spikes, 1.85c. to 1.90c.

**Pig Lead.**—The local market is quite steady, with fair demand. Sellers probably stiffer as end of month approaches and October wants are to be arranged for. Desilverized remains at 4.32½c. Lead Ore is unchanged at \$46 per ton.

**Spelter.**—Domestic trade does not show much activity; prices show a slight advance, the last sale having been made at 3.95c. Zinc Ore brought \$27.50 per ton as the top price.

## The British Iron Market.

**Summary.**—The general position in the Iron and Steel trades shows little alteration on the week; but if anything there is a more favorable tendency, although prices are weak in some districts. Pig Iron is in fairly good demand, and prices keep up, while in the finished branches business is coming forward a little more readily, as a result, no doubt, of the improvement in the shipbuilding industry. The engineering trades are busy for the most



part, although some departments are quieter. In the United States the market is in an unsettled condition, and Pig prices are lower. On the Continent, German trade appears to be slowing down a little, while in France and Belgium makers report a dearth of new work.

**Pig Iron.**—During the past week warrants have been rising in value, Cleveland being quoted at 72 shillings 6 pence, while Scotch have touched 76 shillings 10½ pence, as compared with last week's quotation of 76 shillings 1 penny. In regard to Makers' Iron, the demand for No. 3 Cleveland is good, and outruns the supply, which is below the average. Manufacturers are exerting themselves to make up the deficiency, as this is the quality chiefly wanted for export, and is generally more salable than the inferior brands, of which there is plenty offering. These latter do not find buyers readily, and some has to go into stock. Shipments from Middlesbrough went up by over 11,000 tons during August, and the stocks in the public warrant stores increased 1600 tons during that month, but they are now being rapidly reduced. No. 3 has been sold at a minimum price of 71 shillings during the week, but for delivery this and next month an additional 6 pence has been realized. No. 4, the quality mostly exported to Scotland, is now four shillings instead of 6 pence below No. 3, and consequently Cleveland makers are rapidly regaining lost ground north of the Tweed. Supplies of Hematite are now more easily obtainable, and prices of East Coast are slightly easier, sales having been made at 85 shillings 6 pence; but even at this price it is dearer than West Coast Iron. In Barrow, makers of Hematite are well situated with regard to work, and there is a steady demand.

**Manufactured Iron and Steel.**—In the finished branches of the trade there is not much change in the situation to note. Taking the position all through, business appears to be coming forward a little more freely, although buyers are disposed to defer orders until the last possible moment in order to see if makers are inclined to make any further concessions. Operations are still on a small scale and most of the orders are for prompt delivery. The tone of the market in Lancashire appears to be less satisfactory than in South Staffordshire and other districts, prices, especially of Steel, being weak, although no change in the official rate has been made. In Middlesbrough the pressure for deliveries is nothing like that experienced in the first half of the year, and Galvanized Sheets have been reduced 10 shillings, quotations being £12 10s. for Iron and £13 for Steel. Bar manufacturers in the Cleveland district are keeping up prices, although Scotch makers are now selling fully 10 shillings below them.

**Engineering and Shipbuilding.**—In the engineering trades most sections are well employed and are booking new work in satisfactory quantities, but in some activity is not so fully maintained. Taking the situation all through, the outlook is by no means discouraging, as a good deal of work now held in abeyance owing to the present high cost of production, must be given out shortly, whether prices recede or not. In the shipbuilding industry there is more doing. The output on the Clyde last month consisted of 22 vessels, representing an aggregate of 33,830 tons, and the new orders placed amount to 37,000 tons.

**Foreign.**—On the Continent the French makers of Finished Iron seem to be meeting with some success in their efforts to keep up prices at the present high level, but they are not profiting greatly, as consumers persistently refuse to give out orders unless they can obtain big concessions. No improvement is observable in the Rolled Iron trade in Belgium, which continues very irregular in all its branches, and though there is a fairly good home demand it does not make up for the heavy falling off in the export inquiry. The tendency of the Finished Iron trade in Germany is less satisfactory than of late, and makers are beginning to find some difficulty in obtaining orders.

**Comparison of Prices.**—The annexed table shows the current prices compared with those of last week, and of the corresponding period last year:

	Sept. 6, 1900.	Aug. 30, 1900.	Sept. 7, 1899.
<b>Iron Ore—</b>	s. d.	s. d.	s. d.
Rubio, Middlesbrough.....	21 9	21 9	17 6
Rubio, Cardiff.....	20 6	20 6	15 9
Potters Mine, North Staffordshire.....	30 6	30 6	14 6
Hematite, West Coast (at mines)...	19 6	19 6	16 0
<b>Pig Iron—</b>			
No. 3 Foundry, Middlesbrough.....	71 3	71 0	68 0
Warrants.....	72 6	72 0	67 10
Scotch Warrants, Glasgow.....	76 10½	76 1	69 7½
Hematite Warrants, West Coast ..	81 6	80 9	73 4
Cold Blast (Foundry), South Staffordshire.....	130 0	130 0	110 0
Welsh Hematite, Cardiff.....	84 0	84 0	84 6

	£ s. d.	£ s. d.	£ s. d.
<b>Manufactured Iron and Steel—</b>			
Marked Bars, South Staffordshire	11 10 0	11 10 0	9 10 0
Common Bars.....	10 15 0	10 15 0	8 10 0
Steel Rails, Middlesbrough.....	7 5 6	7 5 6	6 15 0
Steel Rails, West Coast.....	7 5 0	7 5 0	6 10 0
Steel Rails, Cardiff.....	7 5 0	7 5 0	6 10 0
Steel Angles (eng.), Middlesbrough	8 10 0	8 10 0	7 10 0
Steel Angles (eng.), Glasgow	8 2 3	8 2 6	7 7 6
Steel Plates (ship), Middlesbrough	8 0 0	8 0 0	7 12 6
Steel Plates (ship), Glasgow.....	8 2 6	8 2 6	7 15 0
Tin Plates, Bessemer IC Cokes, South Wales.....	s. d.	s. d.	s. d.
	14 0	14 6	15 3

—Iron and Coal Trades Review, September 7, 1900.

## New York.

Office of The Iron Age, 232-238 William street, }  
NEW YORK, September 19, 1900. }

**Pig Iron.**—The market has been rather quiet, only a routine business being done in this market. Freight continues high for export and are checking business. Quotations are as follows at tidewater: Lehigh, Schuylkill and Virginia Irons, No. 1, \$16.50 to \$18; No. 2 X, \$15.25 to \$16.50; No. 2 Plain, \$14.25 to \$15.50; Gray Forge, \$13.75 to \$15. Tennessee and Alabama brands, No. 1 Foundry, \$16.25 to \$16.50; No. 2 Foundry, \$15.25 to \$15.75; No. 1 Soft, \$16.25 to \$16.50; No. 2 Soft, \$15.25 to \$15.75; No. 3 Foundry, \$14.25 to \$14.75; No. 4 Foundry, \$13.75 to \$14.25; Gray Forge, \$13.50 to \$14.

**Cast Iron Pipe.**—Reports as to the Washington letting have not yet come to hand. The market generally is quiet. We quote \$23.50 to \$24 for 8-inch Pipe at tidewater.

**Steel Rails.**—The trade is looking forward with much interest to the coming meeting, and the possibility of an open market is being discussed. We continue to quote nominally \$30 to \$31 for Standard Rails, tidewater. Light Rails are weak at \$25. We quote Spikes, 1.50c. to 1.75c.; Splice Bars, 1.35c. to 1.50c.; Square Track Bolts, 2.25c. to 2.40c., and Hexagon Bolts, 2.35c. to 2.50c.

**Finished Iron and Steel.**—Aside from the contracts for the material for a number of school houses in this city, little work of any magnitude has been placed. We quote as follows at tidewater: Beams, Channels and Zees, 1.65c. to 1.70c.; Angles, 1.30c. to 1.40c.; Tees, 1.65c. to 1.75c.; Bulb Angles and Deck Beams, 1.90c. to 2c.; Universal Mill Plates, 1.25c. to 1.30c. Sheared Steel Plates are 1.20c. to 1.30c. for Tank, 1.35c. to 1.40c. for Shell, 1.50c. to 1.70c. for Flange, 2.10c. to 2.30c. for Fire Box, 3.50c. to 4c. for Locomotive Fire Box, on dock. Charcoal Iron Plates are held at 2.25c. for C. H. No. 1, 2.75c. for Flange, and 3.25c. for Fire Box. Refined Bars are 1.30c. to 1.35c.; Common Bars, 1.15c. to 1.35c.; Soft Steel Bars, 1.15c. to 1.30c., and Hoops, 2c. to 2.25c., base, on dock.

Wm. H. Perry Company of Providence, R. I., well-known dealers in Scrap Iron, have established a branch office and yard at Portland, Maine, which is in charge of George B. Boutwell, of large experience in the Iron trade in New England.

Charles S. Stephens, who was for many years representative in the East of the Riverside Iron Works of Wheeling, W. Va., until the consolidation of the latter with the National Tube Company, has accepted the agency for the State of New York of the Woodward Iron Company of Woodward, Ala., makers of Pig Iron. Mr. Stephens has his offices at 21 Beekman street, New York.

## Metal Market.

Office of The Iron Age, 232-238 William street, }  
NEW YORK, September 19, 1900. }

**Pig Tin.**—Since our last report the market has undergone a rather marked change, prices declining heavily, both here and abroad. Prices in this market closed weak to-day at 28.60c. for spot, and plenty of sellers at that figure. The London market declined £11 up to this morning, but recovered £2 shortly before the close. The closing prices were £127 10s. for spot, and £125 10s. for futures. The heavy declines in London and here are due to lack of demand coupled with the heavy supplies coming into this market this month. Shipments from the Straits for the first half of this month showed an increase of 560 tons, aggregating 2290 tons. This is in comparison with the same period of last year. The outlook, it is said, is for a large increase in the visible supplies this month. Together with the dullness of business this fact forced prices down.

**Copper.**—Business has been very quiet, but prices are unchanged. Lake Superior Ingot is quoted 16½c. to 16¾c., and Electrolytic and Casting stock being obtain-

able at 10½c. The London market closed a shade lower, with spot quoted at £73 5s., and futures £73 17s. 6d. Best Selected has advanced 10 shillings to £79 10s. Export business is said to be not quite as good as during preceding weeks.

**Pig Lead**—Is unchanged here and abroad. The American Smelting & Refining Company still quote 4.37½c., New York, and 4.32½c. St. Louis. London is unchanged at £17 15s.

**Spelter**—Has strengthened considerably in tone, and prices have advanced a shade. Yesterday values recovered about ten points from the lowest prices of the week, and while to-day values have receded slightly the market closed firm at 4.10c. to 4.15c., with little offering at the former figure. High grade brands command 4.25c. to 4.35c. London has advanced to £19 2s. 6d.

**Antimony**—No change is to be noted. Hallett's is quoted 9½c. and Cookson's 10½c.

**Nickel**—The strength of this article is not only unshaken, but there are strong indications that when the prices for next season are made a considerable advance will take place. Large lots are not to be had, and the prices of small lots continue unchanged at 55c. to 60c.

**Quicksilver**—There is no change. Prices quoted here are \$51 per flask of 76½ lbs. for lots of 50 flasks and more. London cables £9 2s. 6d.

**Tin Plate**—The situation is without change. Prices which are being quoted by the American Tin Plate Company for the balance of this month are on a basis of \$4.84 per box of standard 100-lb. Cokes, New York delivery, or \$4.65 per box f.o.b. mill. No quotations are being given for later than September delivery. Business is said to be very satisfactory. No agreement has as yet been reached between the Tin Plate Company and the committees of the Tin Workers' International Protective Association. A meeting was held in this city during this week, but the committee representing the tanners decided not to act on the terms held out by the A. T. P. Company. They have referred the matter to the individual lodges and it will be voted on at the lodge meetings on Saturday night of this week.

John Stanton reports the Copper production in the United States and of the foreign reporting mines and United States exports as follows, in gross tons of 2240 lbs.:

	Reporting mines.	Outside sources	Total U. S. product.	Product foreign mines.	U. S. exports.
First half 1895....	70,612	9,100	79,712	42,484	34,215
Second half 1895....	84,885	6,600	91,485	43,674	30,507
Total 1895.....	155,497	15,700	171,197	86,158	64,722
First half 1896....	94,180	7,200	101,380	42,255	58,216
Second half 1896....	95,314	7,200	102,514	43,941	67,287
Total 1896.....	189,494	14,400	203,894	86,196	125,503
First half 1897....	103,651	5,000	108,651	44,463	64,870
Second half 1897....	100,555	6,900	107,455	44,007	64,340
Total 1897.....	204,206	11,900	216,106	88,270	129,210
First half 1898....	112,687	7,800	120,487	40,880	68,284
Second half 1898....	103,585	10,250	113,785	43,674	76,831
Total 1898.....	216,272	18,050	234,322	84,554	145,115
First half 1899....	111,987	12,500	124,487	43,429	56,460
Second half 1899....	118,818	18,900	137,719	45,611	63,351
Total 1899.....	230,805	31,400	262,206	89,240	119,811
First half 1900....	114,177	20,400	134,577	43,153	90,747
July, 1900.....	19,612	3,400	23,012	7,443	11,636
August, 1900.....	17,667	3,400	21,067	7,535	13,861

The Phosphor Bronze Smelting Company, Limited, of Philadelphia, have issued, under date of September 10, a price-list, No. 17, on Roll and Sheet Phosphor Bronze, Wire, Rods and Wire Rope. They also make Elephant Brand Ingots, Castings and Phosphor Bronze Alloys.

## Trade Publication.

**Feed Water Heaters**—The Harrison Safety Boiler Works of Philadelphia, Pa., have just issued a new catalogue, illustrating and describing the latest and most improved designs of the Cochrane feed water heaters and purifiers and the Cochrane special heaters and receivers. Those interested will find the catalogue a very comprehensive treatment of the subject, the merits of the heaters being fully described and illustrated by numerous half-tone engravings and detail drawings of sectional views and construction.

A number of the tube workers formerly employed in the National Works of the National Tube Company, at McKeesport, have left for Birmingham, England, where they will work in the new plant of Lloyd & Lloyd at that place.

## The Electrically Driven Plant of the Illinois Steel Company.

According to the *Electrical Review* the plant of the Illinois Steel Company, at South Chicago, Ill., shows in a striking manner the advantages that are to be derived from the use of electricity as a motive power in place of steam and other methods of driving. After having tried various other methods of operating, including steam, hydraulic and pneumatic power, the company, in 1894, began to install electric machinery. In 1895 they had some 50 motors in use, aggregating 650 horse-power, operating cranes and ingot charging machines. In 1898 the number of motors had increased to 100, aggregating 1800 horse-power, and at the beginning of 1900 the total horse-power of the electric motor installation had grown to 4000. Motors aggregating 2000 horse-power are now being added. In addition to the operation of cranes and ingot charging machines, electric motors are now applied to swinging or stationary hoists and derricks, transferring and conveying machinery, including a number of powerful electro-magnetic lifters for steel plates, isolated shears, fans, rolls, pumps, &c.

Some interesting comparisons have been made between the cost of operating the electric plant and the other systems of driving that have been in use. For instance, a scrap breaking, or drop, machine, operated at a distance of 1000 feet from the source of power, cost 35.4 cents per hour, with steam as the motive power; while now, driven by an electric motor, it costs only 6.4 cents per hour. If operated by a separate steam plant it is estimated that it would cost 56 cents per hour to run this machine.

In a plant of this size it is possible to deliver electric power to the various machines at a cost of from ½ to 1 cent per kilowatt-hour. In addition to this economy in the cost of power, a very considerable increase is found in the efficiency of the machine itself, and generally a decrease in the cost of labor. Thus, with the plate handling cranes, when equipped with powerful electro-magnetic lifters, it is found that one man and one crane can do the work of six men and two cranes without the use of electrical apparatus.

The boiler room contains six 250 horse-power boilers, working at 125 pounds pressure. There are three engines, two of the tandem type and one vertical compound. These engines drive three Westinghouse direct current dynamos, two of 400 kw. each and one of 300 kw., all operating at 250 volts. A fourth dynamo of 1050 kw. capacity is to be installed.

A notable feature of the installation is the large total horse-power of motors operated from a power plant of relatively small capacity. The present dynamos, aggregating 1100 kw., or about 1470 horse-power, operate electric motors aggregating 4000 horse-power. Any one not familiar with the operation of large industrial establishments would be struck by the disparity between the capacity of the generators and that of the motors. In this instance the average load on the generators is only about 750 horse-power, or only 18 per cent. of the total rated capacity of the motors. This, however, is in accordance with the general experience, comparatively little of the machinery in such a manufacturing plant being run continuously. Thus, in the case of the traveling cranes, the motors are in operation for only a small portion of the total working time of the plant, and thus throw on the generators an average load that is very slight indeed. The same is true, though to a lesser degree, of the motors operating rolls, pumps, shears, conveying machinery, &c.

In the case of this plant, the capacity of the generators is only about 35 per cent. of that of the motors. In some plants the percentage is smaller; while in others, in which the machinery is run less intermittently, the percentage is considerably greater. But in no case is it necessary to install generators equal in capacity to the motors.

The transmission lines have been figured for a loss of 10 per cent., the longest distance over which power is transmitted being 2000 feet, and the average distance about 900 feet. The works are lighted by 300 inclosed and 400 open arcs, and by 3700 incandescent lights, operated on both direct and alternating circuits. A somewhat unusual feature of the plant is a double system of steam piping. Engines and boilers are all connected to each of two sets of pipes, which may be used interchangeably.

A grand prix has been awarded to the French branch of the Babcock & Wilcox Company, manufacturers of water tube boilers.

Report has it that the bolt and rivet manufacturers of Scotland have formed an association to regulate prices.



## QUOTATIONS OF IRON STOCKS DURING THE WEEK ENDING SEPTEMBER 19, 1900.

Cap'l Issued.		Sales	Thursday.	Friday.	Saturday.	Monday.	Tuesday.	Wednesday.
\$29,000,000	Am. Car & Foundry, Common....	3,851	-15	15½-16½	15½-16	.....	-15½	15 -15½
29,000,000	Am. Car & F'y, Pref. (7% Non-Cu.)	2,103	61¾-62¾	62½-63½	62½-63	.....	62¾-63	62 -62
19,000,000	Am. Steel Hoop, Common.....	2,300	-19½	19 -19½	18½-19½	18½-18½	-19	18 -19
14,000,000	Am. Steel Hoop, Pref. (7% Cu.)	300	.....	.....	.....	.....	.....	65½-66
50,000,000	Am. S. & W., Common.....	21,162	36½-36¾	35½-36½	34½-35½	32¾-33½	33½-33½	32¾-33½
40,000,000	Am. S. & W., Pref. (7% Cu.)	6,675	74¾-75	74¾-74¾	74½-74¾	72¾-73½	.....	72¾-73
28,000,000	Am. Tin Plate, Common, N. Y.	2,300	.....	.....	27 -27½	23 -26¾	26½-27	26½-26¾
18,325,000	Am. Tin Plate, Pref., N. Y. (7% Cu.)	540	-80½	.....	.....	-80½	.....	80 -80½
7,500,000	Bethlehem Iron.....	160	-57½	.....	57 -57½	-57	.....	.....
15,000,000	Beth. Steel, Par \$50, \$1 paid in...	625	.....	14 -14½	-14	-13¾	.....	-13¾
7,974,550	Cambria Iron, Phila*.....	100	.....	-45½	.....	.....	.....	.....
16,000,000	Cambria Steel**.....	4,360	16½-16½	16 -16½	15½-16	15½-15½	15¾-15¾	15¼-15½
11,000,000	Col. Fuel and Iron.....	3,455	35½-35½	.....	33½-34½	34 -34½	33 -34½	33 -33¾
46,484,300	Federal Steel, Common.....	19,457	34½-34½	33½-34½	32½-33½	32 -33½	33 -33½	32 -33
53,253,500	Federal Steel, Pref. (6% Non-Cu.)	3,205	67 -67¾	-66½	66 -66½	65¾-66	-66	65½-66
32,000,000	National Steel, Common, N. Y.	1,700	-26	.....	25 -25½	24¾-26	.....	24¾-25½
27,000,000	Nat'l Steel, Pref., N. Y., (7% Cu.)	860	.....	84 -84½	-83¾	-84	.....	.....
40,000,000	National Tube, Common, N. Y.	1,905	45 -45½	-45½	45½-45½	45 -45½	-45½	-45
40,000,000	Nat'l Tube, Pref., N. Y., (7% Cu.)	2,809	93¾-94½	91½-91½	91¼-92	.....	-92¾	-92½
5,000,000	Penna., Common, Phila.....	.....	.....	.....	.....	.....	.....	.....
1,500,000	Penna., Pref., Phila.....	.....	.....	.....	.....	.....	.....	.....
12,500,000	Pressed Steel, Common.....	1,405	38½-38½	38½-38¾	.....	38 -38½	38½-38½	38 -38½
12,500,000	Pressed Steel, Pref. (7% Non-Cu.)	432	.....	-73	.....	-71¾	73 -73½	73 -73½
27,191,000	Republic Iron & Steel, Common..	3,315	12 -12½	-12½	11½-12	11½-11½	12 -12½	11½-12½
20,806,900	Repub. Iron & Steel, Pref. (7% Cu.)	511	-53½	53¾-53¾	-53	.....	.....	.....
7,500,000	Sloss-Sheffield S. & I., Common..	.....	.....	.....	.....	.....	.....	.....
6,700,000	Sloss-Sheffield S. & I., Pref. (7% Non-Cu.)	600	.....	.....	-67	.....	.....	65½-66½
30,000,000	Tennessee Coal and Iron.....	20,845	69¾-70	69 -70	67¼-68½	65¾-66¾	66¾-67¾	62¾-67
1,500,000	Warwick Iron & Steel (par \$10)..	860	-8¾	.....	.....	8 -8¾	.....	-7¾

\* Par \$50. \*\* \$9 per share paid in. † 10% guaranteed by Beth. Steel Co. Late Philadelphia sales by telegraph. ‡ Ex-dividend.

**Bonded indebtedness:** Am. S. & W., \$190,656; Am. Tin Plate, none; Cambria Iron Co., \$2,000,000 6% debenture 20 year bonds, 1917, payable option 5 years, assumed by Cambria Steel Co.; Federal Steel Co., \$9,832,000 Illinois 5%, \$7,417,000 E. J. E. R. R. 5%, \$1,800,000 Johnson 6%, \$6,732,000 D. & I. R. R. 5%, \$1,000,000 2d D. & I. R. R. 6%, \$10,000 land grant D. & I. R. R. 5%; National Steel, \$2,581,000 6%; National Tube, none; Tennessee C. I. & R. Co., \$8,367,000 6%, \$1,114,000 7%, \$1,000,000 7% cu. pref.; Pennsylvania Steel, \$1,000,000 5%, Steelton, 1st, 1917 \$2,000,000 5%; Sparrow's Point, 1st, 1922, \$4,000,000, consolidated, both plants; Bethlehem Iron, \$1,351,000 5% maturing 1907. Interest and principal guaranteed by Bethlehem Steel Co. Republic Iron & Steel, none; Warwick Iron & Steel, none; Colorado Fuel & Iron Co.; Col. Fuel Co. Gen. Mort. 6% \$890,000, Col. Coal & Iron Co. Mort. 6% \$2,810,000, Col. Fuel & Iron Gen. Mort. 5% \$2,303,000. Also outstanding \$2,000,000 preferred stock with accumulated dividends of \$640,000 to June 30, 1899. Sloss-Sheffield St. & I. Co., Sloss I. & S. first mortgage 6%, \$2,000,000, Sloss I. & S. general mortgage 4½% \$1,885,000.

## Iron and Industrial Stocks.

Generally speaking steel stocks suffered a decline during the week under review, in common with the stock market in general. Among the stocks which have suffered are the American Steel & Wire issues, Cambria Steel, Colorado Fuel & Iron, and particularly Tennessee Coal & Iron, which showed a heavy decline. To-day under sales of 11,000 shares the market dropped from 67 to 62½, closing at 63¾.

	Bid.	Asked.
American Bicycle Company, Common.....	5½	6
American Bicycle Company, Preferred.....	27	31½
American Bicycle Company, Bonds.....	70	80
E. W. Bliss, Common.....	.....	137½
E. W. Bliss, Preferred.....	125	.....
Cramp's Shipyard Stock.....	75	80
Diamond State Steel.....	3¾	3¾
International Silver, Common.....	3¾	4
International Pump, Common.....	17	18½
International Pump, Preferred.....	65	66
Otis Elevator, Common.....	25½	26½
Otis Elevator, Preferred.....	86	87½
Pratt & Whitney, Common.....	3½	5
Pratt & Whitney, Preferred.....	50	55
U. S. Projectile.....	95	100
Tidewater Steel.....	6	7
U. S. Cast Iron Pipe Company, Common.....	3¾	4½
U. S. Cast Iron Pipe Company, Preferred.....	30	32
H. R. Worthington, Preferred.....	.....	110
Empire Steel, Common.....	6	10
Empire Steel, Preferred.....	30	36

**Sloss-Sheffield.**—The Sloss-Sheffield Steel & Iron Company report for the quarter ended August 31:

Profits of operation.....	\$199,752
Deduct for depreciations and charges to extraordinary repair and renewal fund.....	27,377
Net earnings.....	\$172,375
Three months' accrued interest on bonds.....	\$50,644
Three months' proportion of taxes.....	6,202
	56,846
Net profits.....	\$115,529
Actual surplus carried over May 31, 1900, after payment of dividends.....	411,155
Total.....	\$526,684
Dividend on preferred stock for quarter ended August 31, 1900, at 1¼ per cent.....	114,000
Total surplus.....	\$412,684

**American Smelting & Refining.**—The American Smelting & Refining Company report for the year ended April 30 last:

Assets—	
Real estate, plants and machinery.....	\$48,994,499
Inventories of stocks on hand.....	11,773,923
Cash accounts receivable, bills receivable, stocks and bonds.....	3,023,975
Treasury stock.....	10,200,000
Total.....	\$73,997,397

Liabilities—	
Accounts and bills payable.....	\$4,764,489
Bonds outstanding (\$1,005,000 since paid).....	2,253,000
Capital stock.....	65,000,000
Surplus April 30.....	1,979,908

Total.....\$73,997,397

The profits of the year were as follows:

First six months.....	\$1,228,943
Second six months.....	2,206,018

Total.....\$3,524,961

Less three dividends paid.....1,545,053

Surplus.....\$1,979,908

H. L. Terrell was elected a director at the annual meeting of the stockholders to fill a vacancy which has existed for a year.

The General Electric Company have declared a dividend of 2 per cent. on the common stock, payable on October 15 to stockholders of record of September 25.

The directors of the Pennsylvania Steel Company have declared the regular quarterly dividend of 1¼ per cent. on the preferred stock, payable October 16 to stockholders of record September 29.

The Otis Elevator Company have declared the quarterly dividend of \$1.50 per share on their preferred stock, payable October 13 to stockholders of record September 22.

The directors of the Federal Steel Company have declared a quarterly dividend of 1½ per cent. on the preferred stock.

## Bids on a Pumping Plant.

At the Bureau of Yards and Docks, Navy Department, the following bids were received for installing a pumping plant for dry dock No. 3, New York Navy Yard:

Item 1, pump well, house, machinery piping, &c., complete as per plans and specifications; item 2, pump well, machinery and piping, furnished complete and installed, Government to furnish discharge culvert and install new suction pipe from shoe to first elbow; item 3, pump well, house, machinery, discharge culvert of greater length, three entirely new 45-inch suction pipes with shoe and 16-inch drainage pipe installed complete with entirely new suction chamber in dry dock, and increased work connected with crane tracks. The alternate location to be shown upon the plans:

United Engineering & Constructing Company, New York City, 1, \$79,435; 2, \$74,920; 3, \$78,000.

Robert G. Packard, Morristown, N. J., 1, \$91,420; 2, \$87,350; 3, \$95,345.

Williams & Gerstle, New York City, 1, \$86,490; 2, \$77,900; 3, \$89,950.

Camden Iron Works, Camden, N. J., 1, \$89,000; 2, \$79,400; 3, \$75,000.

## The New York Machinery Market.

Office of *The Iron Age*, 282-288 William street,  
New York, September 19, 1900.

In certain quarters of the trade it is not denied that disappointment is felt regarding the present condition of business. This dissatisfaction is due simply to the fact that the parties referred to are not taking many orders. Influencing elements, such as the Presidential election and the fact that we are experiencing the first relaxation from an especially trying summer, do not enter into the calculations of these parties. They are simply bewailing the fact that "business is dull and the only inquiries we know of are those that we scare up."

There is another class in the machinery district, however, a more conservative, more optimistic class. They voice the sentiment that business is just as good as could be expected. They see a fair amount of future business coming along nicely and are eager to state that values are doubtless a little stronger than they were six weeks ago. It is true that there are not many really good things floating about, but the aggregate of the smaller transactions is sufficient to warrant the cheerful countenance, and the prospects for the future are sufficient to maintain hopefulness.

There are a number of concerns who are not only perfectly contented with the conditions of to-day, but who look forward to a good business within the coming month.

Builders of heating and ventilating apparatus are reaping good business and are now busy making proposals to many concerns who have put off the heating of their new buildings as long as possible. As the time for cold weather approaches this business will steadily increase.

Numerous other concerns who have held off for some time are now being forced to close by the approach of the fall and winter months.

Manufacturers of small tools, such as measuring instruments and tool room supplies, are experiencing a very good demand just now. The cutter business is said to be excellent. This is also the case with gearing and general supplies and repairs, &c.

Throughout all the falling off of demand in machine tools there is one type of tool that has maintained its scarcity. It is the grinding machine. Universal grinders have had an excellent run, which has not yet abated. The builders of these machines have constantly been in arrears of their orders, and many good opportunities for sales have been allowed to pass unaccepted. The value of universal grinding is steadily becoming more appreciated in shop practice, and authorities in machine tool matters declare that the boom of the grinding machine is in its infancy.

While certain pneumatic tool manufacturers are working under extreme pressure in order to fulfill their obligations, others appear to be a little short of orders. It is stated in this connection that a certain firm have dispensed with about half of their shop hands.

There is also a rumor floating about to the effect that a prominent lathe building concern have recently discharged about 100 men. This illustrates one of the drawbacks in specializing and putting the machines through in large numbers.

European business has increased slightly but is still dull. A comparatively small amount of machinery is now being shipped to Germany. England is furnishing more encouragement. English engineers who were in attendance at the Paris Exposition are beginning to show the fruits of their visit by ordering improved American machinery which was exhibited. The various electrical concerns who are building large plants in England are among the most conspicuous purchasers at present.

The various automobile companies in this country are constantly in touch with machinery merchants. Besides those referred to from time to time in this column the De Dion, Bouton Motorette Company of Church lane and Thirty-seventh street, Brooklyn, have been picking up a little machinery recently. They are building a machine with a French gasoline motor. The motor is imported, and most of the parts of the vehicle are now being purchased by the company, their work consisting chiefly in assembling the parts.

We have finally ascertained the facts regarding the former plant of the Stephenson Car Company at South Elizabeth, N. J. The plant is now owned by the St. Louis Car Company, who will use it in turning out street cars. While it has been stated that the present owners of the plant are purchasing machinery, we are reliably informed that a large amount of new machinery was installed just prior to the failure of the Stephenson interests. J. A. Tackaberry is superintendent and P. M. Kling is manager of the plant at present.

In a recent issue we mentioned the fact that the Marine Engine & Machine Company would fit up their plant at Harrison, N. J., for the manufacture of electric ele-

vators. We are informed that they have given the order for their entire machinery equipment to Manning, Maxwell & Moore. An electric traveling crane is included.

The Seaboard Coasting Company of Chester, Pa., purchased a good sized machine tool equipment from a Liberty street house.

A change that will require considerable machinery is being made at the plant of the John Simmons Company of 110 Centre street, New York. The company have acquired a new building on Franklin street, to which their fitting shop will be removed. The building, which is to be vacated through the operation, is to be fitted up with machine tools for the manufacture of plumbers' supplies and steam fittings. F. H. Gottlieb has been awarded the contract for the power transmitting outfit.

We are informed that John J. Grant of the Grant Machine Tool Company of Cleveland, Ohio, has been appointed consulting engineer to the Franklin Air Compressor Company. As previously stated in this column, this company have recently absorbed the New York Air Compressor Company, and are building new works at Franklin, Pa. Mr. Grant will re-design the company's air compressor and supervise the equipment of the new shop.

The United States Projectile Company of South Brooklyn have just placed a substantial order with Manning, Maxwell & Moore for machinery to be added to their new motor gear cutting department. Manning, Maxwell & Moore also received an order from the Foster Engineering Company of Newark, N. J., for the equipment of machine tools which they are to add at their new works on Monroe street.

William R. Trigg & Co., of Richmond, Va., purchased two 25-ton traveling cranes from the Shaw Electric Crane Company of 85 Liberty street.

Machinery will shortly be required by the Ludlow Mfg. Company, of Ludlow, Mass., for a 10,000 horsepower hydraulic plant. Holbrook, Cabot & Daly of 44 Union Square, New York, are now building a dam across the Chicopee River in connection with the work. The power will be carried  $4\frac{1}{2}$  miles to the company's plant. The company operate jute mills.

Changes are being made at the works of the Weidman Silk Dyeing Company of Paterson, N. J. The Flint Construction Company are in charge of the work. William Downs of 74 Cortlandt street, has just been awarded the contract for 1800 horse-power of fuel economizers.

Contracts are being placed by Lathbury & Spackman of Philadelphia, for the building of a new cement plant. The mills are to be located in Michigan. The Philadelphia firm are engineers for the project.

Orders have been received by the Lambert Hoisting Engine Company of 85 Liberty street for 14 hoisting engines, which will be used in building the New York underground railway. Six of them are to be driven by compressed air and were purchased by Holbrook, Cabot & Daly, who are building section three of the tunnel. The Lambert Company also received contracts for four electric mining hoists from J. G. White & Co. of 39 Broadway. They are to be used at the Deep Leads mines, Australia. Another six drum hoisting engine has been sold to the Merritt-Chapman Derrick & Wrecking Company of this city. It will have a maximum capacity of 150 tons and will be placed on the new wrecker, "Century," now building at the Crescent shipyard.

The Buffalo Forge Company of 39-41 Cortlandt street have secured an order for a down draft forge shop from the Peckham Motor Truck & Wheel Company of Kingston, N. Y. The plant will consist of 16 large blacksmith forges and numerous oil and coal furnaces. The company are building new blacksmith and boiler shops. They also received a contract for a combined heating and drying system from the Perth Amboy Terra Cotta Company of Perth Amboy, N. J. The largest fan in this installation will be 210 inches in diameter. There are a number of smaller fans, all of which will be engine driven. They also received an order for a complete down draft outfit for a new forge shop which is being built by the New York University at University Heights, N. Y.

Purchases are being made by Andreas & Co. of 11 Broadway for additional equipment for the Costa Rica Electric Light & Traction Company. H. T. Purdy, general manager of the road, has spent three months in this country, looking up machinery and materials. He returned to Costa Rica on Monday last. E. E. Brugerhof of Andreas & Co. will personally represent Mr. Purdy's interests in this country. The company have recently received permission to extend their road to Satana and are also arranging to light additional neighboring cities. They will be improving the road and their lighting plants for some time to come and will constantly be in the market for equipment.

The Perfection Steam Specialties Company, whose shops are located in Bayonne, N. J., have just opened an office at 133 Liberty street, New York. H. W. Ludlam is



in charge of the office as sole representative for the metropolitan district. The company are manufacturers of the Creamer pump governors and receivers, balance steam traps, balance valves, high pressure boiler feeder and pump governors, low pressure boiler feeders, &c. They have just gotten out a special system for the regulating of boilers with heating and other systems, doing away with the receiver and pump.

The Aultman Company of Canton, Ohio, announce that they have arranged with the C. T. Patterson Company, Limited, of New Orleans, La., to represent them in the sale of their complete line of elevating, conveying and power transmission machinery. A competent engineering force is at hand to give attention to inquiries received.

## The Federal Bankruptcy Law.

### Statistics of Its Operation.

WASHINGTON, D. C., September 17, 1900.—Some decidedly interesting official statistics with reference to the recent operation of the Federal bankruptcy law have been compiled by A. C. Brandenburg, in charge of bankruptcy matters in the Department of Justice. Mr. Brandenburg delivered a brief address on the 31st ult., before the National Association of Referees in convention at Saratoga, and in elaborating his remarks for publication he has incorporated some important official data as well as the results of a careful investigation as to the intent of Congress concerning the much discussed section 57, relating to the surrender of payments on account by a creditor in order to participate in the distribution of a bankrupt's assets. The representative of *The Iron Age* is enabled to present the following advance abstract of this interesting statement:

"A summary of the reports of the various clerks of the courts of bankruptcy show the following facts: The total number of voluntary petitions in bankruptcy filed for the six months ending March 31, 1900, was 11,914, as compared with 10,124 for the six months ending September 30, 1899, and 9052 for the six months ending March 31, 1899. The total, therefore, since the passage of the act to March 31, 1900, was 31,905. The total of involuntary petitions filed during the six months ending March 31, 1900, was 969, as compared with 606 in the six months ending September 30, 1899, and 828 for the six months ending March 31, 1899, making a total of 2403 involuntary petitions filed since the passage of the act. Since the passage of the act 72 discharges under voluntary petitions have been refused, and 15 under involuntary petitions. Compositions have been confirmed in 285 cases under voluntary petitions, and in 81 cases under involuntary petitions. Petitions have been filed without the payment of filing fees in 3980 voluntary cases, and in 913 such cases the fees were paid after the filing of the petition.

"An examination of the reports fails to show that the law is being availed of by one section of the country more than another, though, as might naturally be expected, those States with the largest population as a rule show the greatest number of petitions, which, however, does not signify that advantage is being taken of the law by a greater ratio of the inhabitants than in the less thickly populated States.

"This report goes far toward settling a much mooted question agitated at the time of the pendency of bankruptcy legislation before Congress with reference to involuntary procedure. There were eminent men in Congress who substantially insisted that with a feature enabling the adjudication of a man an involuntary bankrupt, the wheels of commerce and business would be stopped with the resulting financial panic. None of these things have come to pass, and instead of an avalanche of involuntary petitions, we are surfeited with voluntary petitions, a very large percentage of which, however, are those of old insolvents. Such an argument overlooks the fact that even in the absence of a Federal bankruptcy law the State statutes place in the creditors' hands process by which a defaulting debtor may be forced into liquidation, or his property seized by garnishment or attachment, leaving as exempt only such as is allowed him by virtue of some law.

"A summary of the referees' report presents some interesting facts. Of the total number of involuntary petitions filed since the law took effect the following figures show the distribution by the occupations of the petitioners: Merchants, 8200; manufacturers, 713; professional men, 920; farmers, 3253; wage earners, 9164; miscellaneous, 8,303. The distribution of the involuntary petitions has been as follows: Merchants, 981; manufacturers, 134; professional men, 13; farmers, 6; wage earners, 48; miscellaneous, 347.

"The figures concerning the liabilities and assets show that as to the voluntary petitions, the liabilities

embraced in those filed for the six months ending March 31, 1900, amounted to \$170,490,401, while the assets were \$18,800,321. For the year ending September 30, 1899, the total liabilities under involuntary petitions were \$355,949,336, and the assets \$37,863,090. These figures show a slight increase in the ratio of assets to liabilities during the last six months referred to. The liabilities under involuntary petitions for the six months ending March 31, 1900, were \$16,539,532, and the assets \$6,858,306, while for the year ending September 30, 1899, the liabilities were \$23,207,181, and the assets \$11,701,713."

Mr. Brandenburg urges the importance of revising the provisions of the law concerning fees on the ground that "the class of men required both for referees and trustees, and the nature of their services are such to warrant compensation commensurate with their ability and the character of their employment;" but he adds that "whatever these fees may be, they should be uniform, and either Congress or the Supreme Court should make them so, and not leave it to the discretion of the various courts, some of which may allow nothing beyond what is specified by law, while others may grant more than ample compensation for every service. It seems to me that there should be some happy medium between the acts of 1867 and 1898."

"Another feature of the practical demonstration of the law," continues Mr. Brandenburg, "which is of vital importance to our commercial interests is that with reference to the construction placed upon section 57, whether all payments, on account, within four months must be surrendered before proof can be made of the balance of the claim.

"In an investigation of the matter I have had occasion to examine the Congressional records and debates, especially those of the Fifty-fifth Congress, during which the present law was enacted. The reports in Congress are silent with reference to this provision, but an examination of the debates shows that two remarks were made on the subject, one in the Senate and the other in the House. In the House, Representative Connolly of Illinois, a member of the Judiciary Committee, made the following statement:

"To pay a creditor in the ordinary course of business is not to make him a preferred creditor; but the debtor must do this with a specific evil intent at the time. He must do it, first, when he is insolvent; second, it must be done by him in contemplation of bankruptcy. And it must be done not only in contemplation of, but with the full purpose of evading the bankrupt act itself by giving a person preferred an undue advantage in the distribution of his estate under the law. Now, what object is there or could there be to such a law as that? It is not "preference" in the ordinary course of business. We are constantly making preferences ourselves. Men in trade, all of them at times, prefer one creditor over another. It is a common occurrence in business. Here are a number of accounts due by the merchant to the wholesale dealer. He cannot pay all of them this time. He sends a draft to A or to B, and says that to-morrow or next week he will send others to the rest of the merchants to whom he is indebted.

"Is that a preference within the eye of the law? No; by no means. Under this law it is not and cannot be a preference. It is not done when he is insolvent or with a view of taking advantage of the provisions of the bankruptcy laws. It is not taken even in contemplation of insolvency or bankruptcy proceedings. So the act is carefully guarded not to interfere with those who are doing business in the ordinary way, transacting their business legitimately with a view to its proper conduct and with no intent to defraud. The law goes alike to the interest of all parties—to the interest of the debtor and to the interest of the creditor in the distribution of the estate."

"Senator Lindsay of Kentucky, a member of the Senate Judiciary Committee, in discussing the bill, said: 'Preferences are forbidden, and when given with the knowledge of the creditor, his property or its value, or the money paid, may be recovered by the trustee; payment in the ordinary course of business by the debtor in good faith will not be construed as a preference.'

"My individual judgment is, however the language of Section 57g is interpreted, it was not the intention of Congress to require the surrender of payments made on account without guilty knowledge or intent to defeat the law before a claim could be proved for the balance of the account, and I am pleased to note that Judge Brown of the United States District Court, *in re Smoke*, has within the past ten days sustained the decision of Referee Wise, holding that payments made in good faith in the ordinary course of business need not be surrendered."

W. L. C.

It is said that the Baltimore & Ohio Railroad will rebuild their bridges over the Ohio River at Wheeling and Parkersburg next summer.

# HARDWARE.

## Condition of Trade.

**T**HE volume of business compared with that for the corresponding week of last month shows a slight increase, made up, as it has been, of a multitude of small orders. Demand is still restricted, and the prospects are not encouraging for any immediate revival of trade to large proportions. Jobbers are likely to pursue a conservative policy in buying for the coming six weeks or more, and retail merchants will probably continue on the same lines. Goods that are ordered are wanted immediately, and from indications stocks are generally being run on as narrow a margin as possible. The general tendency of the market is still to lower values.

### Chicago.

(By Telegraph.)

Colder weather early this week transferred the demand for Hardware to the usual fall goods. Dealers who ten days ago asked that shipments on purchases made last spring on guaranteed prices be delayed until October 1, have this week telegraphed for the same for immediate shipment. One jobbing house has, in response to this quick and general inquiry, been working every night this week to date. The shipping rooms of jobbers now show a large predominance of such goods as Stove Boards, Hods, Elbows, Stove Pipe, Dampers, Sheet Iron, Coal Shovels, &c. Wide publicity of the strike in the anthracite coal regions has also helped turn the mind of the householder from his previous indifferent attitude to one of deep concern and immediate action, and the Hardware dealer in response to these demands has forwarded his orders. The limitation of trade to quick needs has not departed, but the needs have multiplied. Some delay is reported by jobbers in securing goods from manufacturers. It is not that there is a scarcity of goods to any desired amount that merchants wish to purchase, but the maker seems to be pursuing the same policy as the ultimate individual purchaser. The volume of trade is fairly seasonable and a good business is anticipated. Heavy Hardware is moving freely and orders from small manufacturers are of the usual hurry description.

### St. Louis.

(By Telegraph.)

The arrival of cooler weather has stimulated a decided demand for heating goods. Stoves, especially air tight Heaters, are being largely shipped. The related small supplies and Stove Boards are in good action. All lines of Hardware, excepting, perhaps, Builders' Hardware, are noted as called for by the retail trade. Assembling floors have every available space occupied by goods ready for packing. It is especially remarked that the retail trade gives evidence of the comparatively limited stocks on its hands by the liberality in number of mail orders sent to jobbers. St. Louis jobbers are satisfied that their sales will closely approximate in value those of last year to this period. A progressive jobber at an interior point remarked that his business of last week was the best in 20 years. While no radical change is looked for in the nature of buying for some time, there are indications that purchases are not altogether being made in a hand to mouth way. Some of the trade say that manufacturers have no extensive stocks on hand and that it is wholly likely that they

will not be in position to meet the demand during the next few months.

### Boston.

**BIGELOW & DOWSE COMPANY.**—The fall trade is opening satisfactorily. Customers' stocks are light, and orders cover good lines of Hardware. Prices are being well maintained, and while the amount of sales may be less on account of the reduced prices the volume will compare favorably with that of the past year.

The trade expect reduced prices on staple goods where the principal cost is for raw material, but they do not favor reductions as made on goods held by combinations and where the cost is largely for labor. The trade are buying only what they need for immediate wants, and a cut in price does not influence orders.

If manufacturers understand this and postpone their revision of prices until the latter part of the year, after the fall trade, every one will be better satisfied.

Many complain of the prices adopted by the Skate manufacturers, but will favor their action in confirming them, so there will be no decline during the season of 1900-1901. Some forget that the manufacturers of these seasonable goods must contract early for their supplies, and it makes no difference if the raw material declines to one-half its former value after the contracts are made and the stock is in manufactured goods, and there is every reason why selling prices should be based on the increased cost to manufacture.

While politics may have some influence on our New England trade, we will not have the exciting contest as in States where the result is not a foregone conclusion.

### Cleveland.

**THE W. BINGHAM COMPANY.**—There is nothing new in the Hardware situation since our last. Trade so far in September has been remarkably good, in fact many of the jobbers have been obliged to work nights in order to keep up with the business. The orders while numerous are very small, but this is to be expected upon a declining market. Collections are good.

### Nashville.

**GRAY & DUDLEY HARDWARE COMPANY.**—We are glad to be able to report an improvement in business since our last report, and at this writing the September trade is fully equal to that of former years.

The unexpected and tremendous advance in the price of cotton has created a much better feeling throughout the South, and the firm tone of the Pig Iron market, and the reported advance in Steel and some other lines, has encouraged the buyers to take hold more freely, and the orders we are receiving now cover a better assortment of goods.

The Hardware jobbers here have been so busy for the past few days trying to cover themselves on Cotton Rope, before the advance, that they have had little time to study market conditions or curse the census enumerators, whom they feel have not done our city justice.

With 10-cent cotton and a fair average crop, and 60-cent wheat and a tremendous yield, we can reasonably expect that trade will be good for the remainder of the fall months.

### Louisville.

**W. B. BELKNAP & Co.**—The market still continues active for finished material. There is a good demand for all classes of goods. The high price of cotton is stimulating trade throughout the South, and now that wheat is advancing we should get a like benefit from grain raising sections. It looks as though it were the farmers'



year to realize. We think he should be well satisfied with the conditions.

The great disaster on the Southern coast is the absorbing topic of conversation and interest. Louisville was the first city to respond, sending \$10,000 on the day after the news was received. The generous response from all quarters is only another evidence that the whole world is akin.

#### Portland, Oregon.

**CORBETT, FAILING & ROBERTSON.**—Ninety thousand four hundred and twenty-six for 1900, against 46,389 in 1890, an increase of 94.95 per cent., was flashed over the wire last Saturday from the Census Bureau. Of course we would have been pleased even though trade had not shown an improved volume in the past two weeks, as it has, with our population showing an increase of nearly 100 per cent. in ten years. Never in its history has our State turned out the goods that it has of late, and we are thoroughly satisfied that we are only on the threshold of an expansion (not national) that will be good for us.

Of late we have been in receipt of several complaints of manufacturers that if jobbers themselves do not maintain differentials granted them by the manufacturers the differentials will be withdrawn. We are glad to see this matter brought to the front. When the writer was in attendance at the National Hardware Association convention in Pittsburgh he was interested in the fight put up for 2 per cent. that has succeeded in so many cases, and the contention that we were entitled to differentials. While there it flashed across him, "How many will maintain the differentials if conceded?" The complaint, it seems, answers the conundrum. The constant violation of implied contract weakens association work, but our genial secretary cannot be blamed in this connection, as he has fought the violations vigorously and constantly called attention to the inevitable result—i. e., that we would lose what we had so long fought for.

Our Elks' Carnival has been and is a "howling success." We wish census could have been taken Elks' Day, when the city was so crowded that many had to walk the streets all night for lack of accommodation.

#### Omaha.

**LEE-GLASS-ANDRESEN HARDWARE COMPANY.**—The wholesale trade of this region continue to enjoy a full measure of activity. No noteworthy features have developed to mark any material changes from previous reports. The demand is for all lines that may be termed seasonable, and the general volume of orders is considered very satisfactory. The tributary territory is in excellent condition. Everybody has business to attend to. Labor is well employed. On an average crops have been abundant, and are realizing good prices.

With these conditions existing business could not very well be otherwise than satisfactory; still there are a few people hereabouts who are not contented even with "a full dinner pail."

#### New Orleans.

**A. BALDWIN & Co.**—There is a constant, steady improvement in the situation in this section of the country, and, in fact, our business is as large as we usually look for during the months of January and February.

The high price of cotton has stimulated all lines of business, and the merchants in this section are getting the full benefit of increased number of orders from day to day.

### Notes on Prices.

**Wire Nails.**—Wire Nails continue to move in about the same volume, at unchanged prices. The request for prompt delivery accompanies orders. Prices are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots.....	\$2.20
To jobbers in less than carload lots.....	2.25
To retailers in carload lots.....	2.30
To retailers in less than carload lots.....	2.40

**New York.**—Hurried orders for small quantities of Wire Nails characterize local demands. Quotations are as follows:

To retailers, carloads on dock.....	\$2.48
Small lots from store.....	\$2.55 to \$2.60

**Chicago, by Telegraph.**—The active state of trade continues in Wire Nails, though the demand is not perhaps quite up to the rather phenomenal orders earlier in the month. It is sufficient to make September one of the banner months of the year in the volume of business. Prices are unchanged. Carloads are quoted at \$2.35 and small lots \$2.40.

**St. Louis, by Telegraph.**—There is said to be quite an active demand for Wire Nails again this week, with quick shipments asked for as before. Jobbers' prices are more uniform and the trade is more evenly distributed in consequence. Price to retailers is \$2.45 in carloads, and \$2.55 in smaller lots.

**Pittsburgh.**—We continue to report an active demand for Wire Nails, larger than it has been for several months. The American Steel & Wire Company have started up more mills since our last report, and are now making and shipping a very heavy tonnage in Nails. The jobbers and small trade are buying heavily and demand promises to be still larger. Prices are without change, as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots.....	\$2.20
To jobbers in less than carload lots.....	2.25
To retailers in carload lots.....	2.30
To retailers in less than carload lots.....	2.40

**Cut Nails.**—Orders for Cut Nails continue in about the same proportion as for some time past. Indications point to low stocks generally. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots.....	\$2.20
To jobbers in less than carload lots.....	2.25
To retailers in carload lots.....	2.30
To retailers in less than carload lots.....	2.40

**New York.**—The local Cut Nail market is without change, either in demand or in prices. Quotations are as follows:

To jobbers in carload lots on dock.....	\$2.13
To jobbers in less than carload lots on dock.....	2.18
To retailers in less than carload lots on dock.....	2.31
Small lots from store.....	\$2.25 to 2.30

**Chicago, by Telegraph.**—The Cut Nail market is without incident, a steady and moderate demand continuing. Quotations remain \$2.25 from store in small lots.

**St. Louis, by Telegraph.**—No particular activity was noted in Cut Nail circles and price remains at \$2.30, base, out of stock.

**Pittsburgh.**—There is a little better demand for Cut Nails, but orders are mostly for small lots. We quote f.o.b. Pittsburgh, terms 60 days, 2 per cent. off in 10 days, as follows:

Carload lots.....	\$1.95
To jobbers in less than carload lots.....	2.00
To retailers in less than carload lots.....	2.10

**Barb Wire.**—The movement of Barb Wire is light and for small lots. Quotations for domestic trade are as follows, f.o.b. Pittsburgh, net cash 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots, Painted.....	\$2.50
To jobbers in carload lots, Galvanized.....	2.80
To jobbers in less than carload lots, Painted.....	2.55
To jobbers in less than carload lots, Galvanized...	2.85
To retailers in carload lots, Painted.....	2.60
To retailers in carload lots, Galvanized.....	2.90
To retailers in less than carload lots, Painted.....	2.70
To retailers in less than carload lots, Galvanized...	3.00

Ellwood and Baker Wire is 5 cents and Washburn & Moen Glidden 10 cents per 100 higher than the foregoing prices.

**Chicago, by Telegraph.**—There is persistence in the demand for Barb Wire, inquiries from the Southwest now taking precedence, and, with the center of demand slowly passing northward, a long continuance is anticipated to the current activity. The cotton regions are

large buyers. Prices are firm, and small lots, Chicago delivery, are quoted \$2.35 for Plain Annealed, \$2.70 for Painted Barb, and \$3 for Galvanized Barb Wire.

*St. Louis, by Telegraph.*—There is a fair and reasonably good demand for Barb Wire at more stable prices. Quotations are as follows: Painted in carloads is \$2.75; smaller quantities, \$2.85. Galvanized commands 30 cents advance on these prices.

*Pittsburgh.*—A good export business is being done in Barb Wire by the leading interest, but the domestic demand is light. For domestic trade we quote as follows: Galvanized Barb Wire, \$2.80, in carload lots to jobbers, and Painted at \$2.50. Term 60 days net, with 2 per cent. discount for cash in 10 days, f.o.b. Pittsburgh.

**Plain Wire.**—The condition of the Plain Wire market remains unchanged, demand being fair for the season. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. off for cash in 10 days:

	Base sizes.	Plain.	Galv.
To jobbers in carload lots.....	\$2.15	\$2.55	
To jobbers in less than carload lots.....	2.20	2.60	
To retailers in carload lots.....	2.25	2.65	
To retailers in less than carload lots.....	2.35	2.75	

The above prices are for the base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the advances indicated in the following table:

Plain Fence Wire Advances (Catch Weights).			
Nos.	Base	Galvanized.	
6 to 9.....	\$0.05 advance over base.....	\$0.40 extra.	
10.....	.10 " " " " " " " " " " " "	.40 " "	
11.....	.15 " " " " " " " " " " " "	.40 " "	
12 and 12½.....	.25 " " " " " " " " " " " "	.40 " "	
13.....	.35 " " " " " " " " " " " "	.40 " "	
14.....	.45 " " " " " " " " " " " "	.75 " "	
15.....	.55 " " " " " " " " " " " "	.75 " "	
16.....	.70 " " " " " " " " " " " "	1.00 " "	
17.....	.85 " " " " " " " " " " " "	1.00 " "	

For even weight bundles, 50 pounds and over, 5 cents per bundle advance on above.

*Pittsburgh.*—There is a fairly good demand for Plain Wire, but buyers continue to place orders mostly for small lots. Stocks in jobbers' and retailers' hands are light, and it is believed there will be a good fall trade in Wire. We quote:

	Plain.
To jobbers in carload lots.....	\$2.15
To jobbers in less than carload lots.....	2.20
To retailers in carload lots.....	2.25
To retailers in less than carload lots.....	2.35

Galvanized Wire up to No. 14 is 40 cents advance on Plain, Nos. 15 and 16, 75 cents advance, and Nos. 17 and 18, \$1 advance. Terms are 60 days net, with 2 per cent. discount allowed for cash if paid in 10 days from date of invoice.

**Shovels, Spades and Scoops.**—At the regular quarterly meeting of the manufacturers of Shovels, Spades, Scoops and Ditching Tools, held in New York last Thursday, no changes were made, the prices prevailing through the last quarter being reaffirmed.

**Builders' Hardware.**—There has been a recent revision of prices by the manufacturers of Builders' Hardware which show reductions on the Standard or Classified lines. Prices now in effect are on a parity with those of July 26, 1899.

**Ice Skates.**—The manufacturers of Ice Skates recently agreed to advance the price of Skates, to take effect October 15, the net advance being approximately 7½ to 10 per cent. The reason given for the advance is that Steel for these goods is of a peculiar grade, which is not produced except by a few mills having special facilities, and that contracts placed at the beginning of the year for this season's supply have been delayed in execution without any disposition to make a concession in price. The advance in material and labor has involved higher cost than was anticipated. Manufacturers have been delayed in getting out their stock, and should there be a good skating season, it is considered doubtful if there will be Skates enough produced in season to meet the wants of the trade.

**Glass.**—There has been no material change in the Glass situation. Factories are being operated to the best advantage possible with the available workmen, as the question of wages has not been settled with all classes of Glass workers. No change has been made in prices.

**Paints and Colors.**—*Leads.*—There is a fair demand for White Lead in Oil, though not excessive. The Lead market continues strong, but the future of the Linseed Oil market is uncertain. Prices remain unchanged as follows: In lots of 500 pounds and over, 6¼ cents; in lots of less than 500 pounds, 6¾ cents per pound.

**Oils.**—*Linseed Oil.*—There is an increased demand for Linseed Oil for immediate requirements. A few carloads have recently changed hands, but the majority of orders are for small lots. Crushers are buying but little more seed than sufficient for their current necessities. For City Raw Oil 65 cents per gallon has become a more general price in lots of five barrels or more, and 62 cents for similar lots of State and Western brands.

**Spirits Turpentine.**—During the early part of the week under review lower prices ruled on Turpentine, which resulted in more liberal buying. This, with advances of increased firmness in the South, caused an advance in price. The market is now firm at 41 cents for Southern and 41½ cents for machine made barrels. Stocks are low at this point and demand fair.

## Letters from the Trade.

Our readers are invited to discuss in these columns questions of trade interest connected with the manufacture or sale of Hardware. We shall be pleased to have a free expression of opinion on subjects deserving the attention of Hardware merchants and manufacturers.

### Builders' Hardware Prices.

The following communication comes from a prominent and representative jobbing house widely known in Hardware circles and takes exception to what they believe to be unwarranted action in the reduction of the price of Builders' Hardware, which, in their opinion, is not justified by existing conditions:

The recent action of the so called American Hardware Association in making a sweeping reduction in their prices was, from a jobber's standpoint, wholly unnecessary and unwarranted by any present market conditions. The unsuspecting jobber, who had been assured of the stability of this ambitious association, finds himself punished for his overconfidence, and his anticipated profits on Builders' Hardware, by a decline in stock on hand, wiped out at one stroke.

It is in a smaller way a repetition of the action of the American Steel & Wire Company in their now famous reduction, and the criticism, which was so universally and deservedly heaped upon the Nail manufacturer, is merited by this action of the Hardware manufacturers in their singular move.

The disposition of the jobber is to sustain the manufacturers in their efforts to establish associations, as, in the main, if intelligently and conservatively conducted, they contribute to a steadier market; but if the jobber is to be treated to surprises of the kind above referred to, he is not likely to continue his support to movements that punish him.

### How to Prevent Running Out of Stock.

We have received a letter from a prominent Hardware concern in the South, in which they state their inability in many cases to ascertain when stock becomes exhausted as the result of sales. We shall be pleased to hear from houses who have systems in use which accomplish the results desired. The letter is as follows:



So many articles are sold out before it is known that in an ordinary sized Hardware house there are always many articles out. There should be some systematic way known and used that will obviate this difficulty.

We have tried a number of different plans, but have never found anything to work satisfactorily, and for that reason would like to hear from others.

### An Example of Close Inspection.

**T**HE following incident recently came under our observation and shows the thoroughness exercised by some of the first-class manufacturers in purchasing goods: A certain well known manufacturing company, one of the oldest and best in their several important lines, executed an order for a concern in this city in the way of tools to be used in their factory. The New York manager of the concern furnishing the goods was sent for to examine what was referred to as an imperfection. On going into the room where the goods were exhibited,

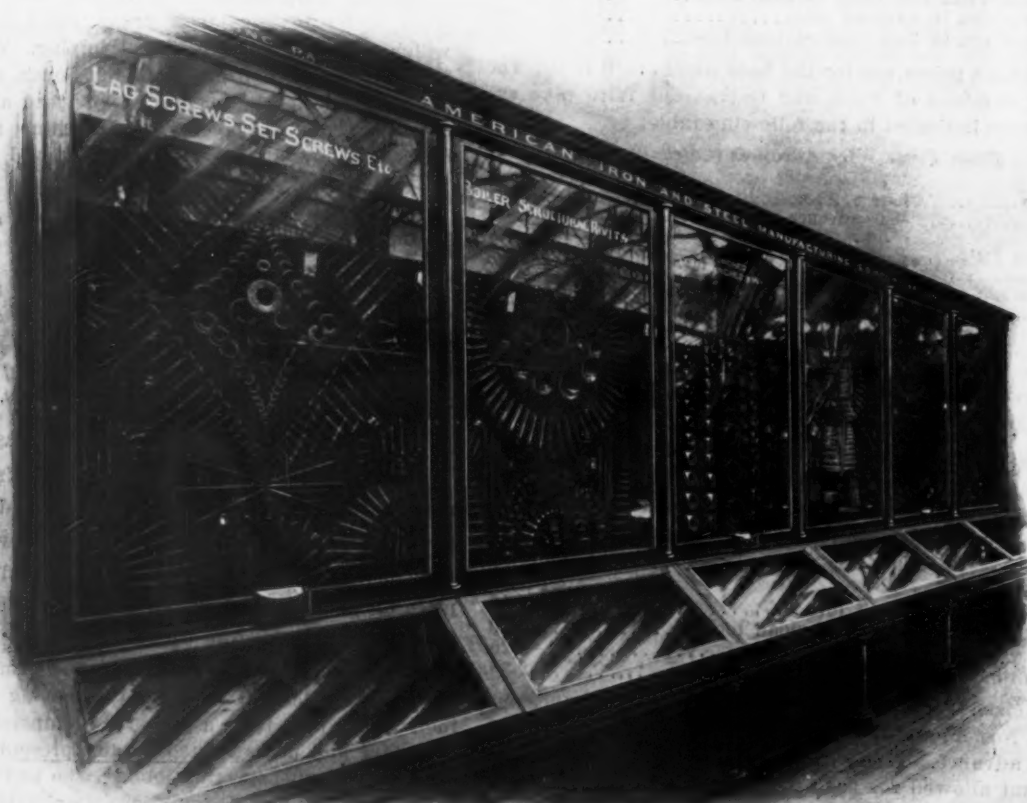
In making the necessary repairs an enlargement of the office was effected, while the general equipment of the store was also bettered. The company express a desire for catalogues from manufacturers of Hardware and Mill Supplies.

Geo. D. Kugel & Sons, Hardware dealers, 2041 Germantown avenue, Philadelphia, Pa., would be pleased to receive catalogues and price-lists from manufacturers of Iron Toys and Shelf Hardware.

### Hardware Exhibits at Paris.—III.

**The American Iron & Steel Mfg. Company,**

Lebanon, Pa., have a large display, occupying six successive show boards. They are all arranged very tastefully; in fact, when it is considered that the decorative



he was astonished to find the goods all apart so that each detail could be examined with care. The superintendent explained that their inspector had discovered a little roughness in the thread of certain long screws which were a principal part of the tool. This was explained by the fact that the company making the goods during the rush demand of last year had worked two shifts of men, and this slight imperfection, overlooked by their own inspector, was the result. The complaint was promptly attended to and the trouble remedied, but what surprised the manager who was summoned to inspect the goods was that everything in the way of supplies that went into that institution was examined in detail with the same care, even to the extent of disassembling the various parts of machinery and tools. We are advised similar goods had been supplied this company for 20 years or thereabouts, and this was the first complaint made of them.

### Requests for Catalogues, &c.

**T**HE wholesale and retail Hardware establishment of the Henry Walke Company, Norfolk, Va., suffered considerable damage from fire a short time since.

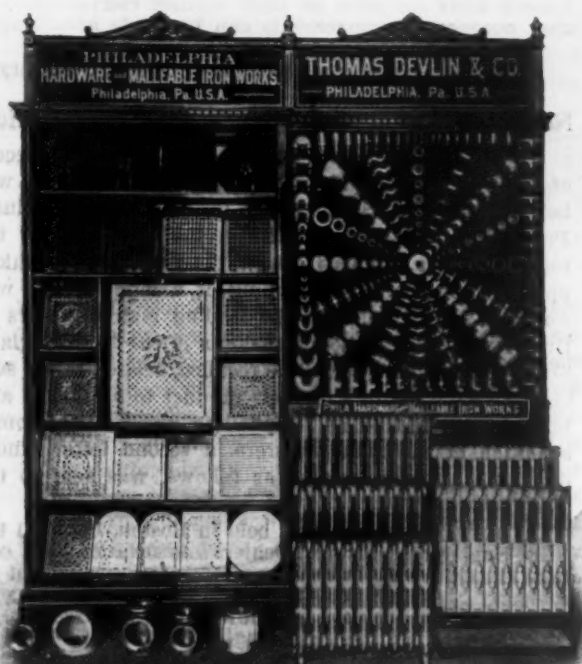
material consists entirely of the plainest kind of articles, it may be said that the effect is surprisingly good. The first board has a design made of Lag Screws and Hooks of all sizes, finished off with set screws. The second board displays Rivets, large and small, as well as Nuts and Bolts, with cross sections showing the various kinds of threads, Whitworth and others. A feature of this board is the tasteful arrangement of many cold hammered tests made of the rivet steel used by the company. Hot and Cold Punched Nuts form the design on the third board, the various sizes up to 4 inches being represented. The fourth board is devoted to Spikes and Turn Buckles, and the fifth board contains specimens of Track Bolts of all kinds, some in section to show the Harvey grip thread, with many tests of Cold Bent Bolts. Stay and Patch Bolts are also displayed here. The sixth and last board is occupied by miscellaneous Bolts and Nuts of Steel and Brass arranged in pleasing figures. The company wishing to show that they did not confine their work to small pieces, have placed in the space below the flat cases a certain number of large Turn Buckles and Nuts and Bolts up to 4 inches in diameter.

**Thomas Devlin & Co.,**

Philadelphia, have two exhibits. One is located in the department of Mining and Metallurgy, and consists of a mahogany case, 3 feet 8 inches wide by 6 feet long.



It contains exhibiting boards on all sides, four of them being thus provided. One side is occupied by a display of Scissors, Shears and Snips, and the other is devoted to nickel plated Malleable Iron Buckles and Saddlery Hard-

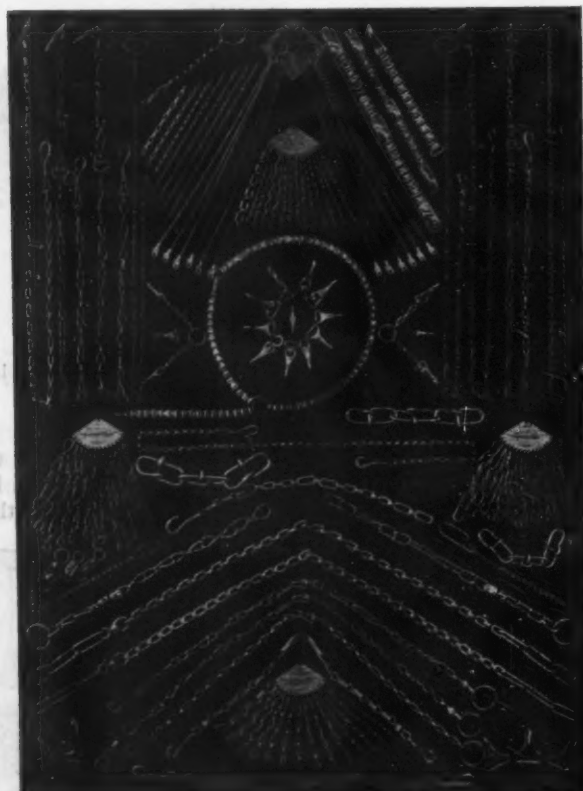


ware. Japanned Saddlery Hardware and Galvanized Pipe Fittings are displayed at each end. The case is surmounted by a pyramid used in showing the various mal-

leable iron articles manufactured by the company, such as Spanners and Wrenches, Marine Hardware, Staples, Screw Hooks, &c. On projection of case will be observed samples of their Coffee Mills, Tobacco Cutters and Sausage Stuffers. Their other exhibit in class 74, Heating and Ventilating, consists of their line of Registers, Radiators and Iron Pipe Fittings for steam. They show Registers of solid brass, bronze metal, and in finishes consisting of black and white japan, nickel, silver and gold plated. Their Radiators are beautifully decorated.

**Oneida Community,**

Niagara Falls, N. Y., make an exhibit of small Chains, &c., in the department of Mining and Metallurgy. One board is occupied entirely with designs made of the many kinds of Chains made by the Community. There are Halter, Hand, Dog, Cow, Log and other Chains of various patterns and construction. The flat American Chain is used for smaller sizes, as for pug and pet dogs, and the Eureka and Niagara Wire Chains come in when heavier duty is expected. There are also samples of Dog



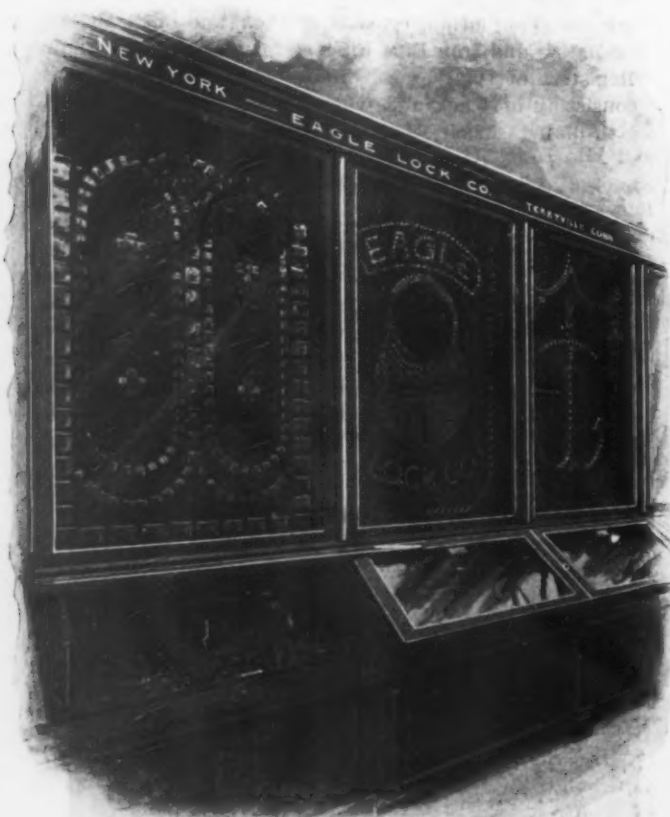
Collars and Snaps of all kinds. All the chains manufactured by the company are weldless and made on special machines. In addition to this Chain exhibit they have in the department of Forestry and Fisheries an interesting display of their line of Animal Traps, as manufactured at their Kenwood, N. Y., plant.

**The Eagle Lock Company,**

Terryville, Conn., have three sections, and the boards have been prepared to display in an attractive shape the Locks, Padlocks, &c., manufactured in the company's works. One board is devoted to Locks. There are Pin Tumbler Drawer Locks with corrugated keys with an unlimited number of changes. The Flat Key Drawer Lock is represented by a large number of samples, as well as ordinary Drawer Locks, Chest Locks, Cash Box and Cupboard Locks; in fact, all that the company put on the market in the shape of Locks. The second board is taken up by brass Padlocks of all sizes and shapes. The main design is a large Padlock made up of little ones. The third board shows polished steel Padlocks worked into an anchor, which forms the main design. The boards are tastefully arranged, and very good use



has been made of the space. In the flat cases below loose specimens are shown, together with a full line of Trunk Locks. The company furnish a catalogue in



four languages, which is of great assistance in giving information.

#### Shelton Company,

Shelton, Conn., display a large number of all sorts of Tacks and Small Nails, both on the show board and in the case below. Carriage Bolts assist in finishing the



design. The Carriage Bolts exhibited by this company, though few in number, have attracted considerable attention from practical men.

## Hardware Organizations.

### Kentucky Hardware and Stove Association.

The following circular letter has been addressed, under date of the 14th inst., to retail dealers in Hardware, Stoves, &c., in Kentucky, with a view to forming a State association, by the Louisville Retail Hardware and Stove Dealers' Association of Louisville. It will be observed that it calls for a meeting in the Board of Trade Hall in Louisville on September 26 and 27 next. On account of the Elks' Carnival now going on in that city and continuing until the 29th inst., reduced railroad fares from any point in the State may be secured. It is hoped that Hardware and Stove merchants generally will recognize the need of such an association, and the important benefits to be derived from it, as illustrated by the experience of similar organizations in other States, and make every effort to be present and participate in the interesting discussions which will be a feature of the meeting. The letter is as follows:

About the first of last March, through aid of circular letters addressed to you and other known retail dealers in Hardware, Stoves, &c., residing in the State of Kentucky, the Louisville Retail Hardware and Stove Dealers' Association ascertained the opinion of enough dealers to justify the belief that a State association was wanted and could successfully be organized.

With the object in view of accomplishing the desired result you are earnestly requested to be present at a meeting to be held September 26 and 27 at the Board of Trade Hall, Louisville, Kentucky, commencing at the hour of 10 a.m.

Headquarters for the reception of visiting dealers will be established at the Willard Hotel, where reasonable rates and good accommodation can be expected.

During the meeting officers will be elected and matters of vital importance to every dealer present will be thoroughly discussed. The object of forming a Kentucky Retail Hardware and Stove Dealers' Association has been fully explained in a previous letter, a copy of which you have probably received and answered.

On account of the Elks' Carnival to be held in Louisville, commencing September 17 and ending September 29, you will be able to take advantage of reduced railroad rates to this point.

All dealers who intend to come, and it is to be hoped that you will be present, will favor me by making known their intention at their earliest convenience, so that necessary arrangements can be made accordingly.

Yours very respectfully,

SAMUEL R. KORB, Secretary.

### New England Hardware Dealers' Association.

The first fall meeting after the usual summer recess of the New England Hardware Dealers' Association was held at the United States Hotel, Boston, on the 12th inst., President George W. Burditt in the chair. After the regular dinner the business of the evening was taken up, beginning with the reading of a letter which was sent out April 28 last to the leading manufacturers of Builders' Hardware doing business in the New England States. This letter, it will be recalled, related to the selling by manufacturers of their product to architects and builders direct, and as it failed to receive the prompt attention of the manufacturers, a second letter, under date of August 8, reading as follows, was sent to the same concerns:

At a friendly conference, held in Boston, between the New England Hardware Dealers' Association and certain Hardware manufacturers, of which your firm or company was one, the following resolve of the committee appointed by the association was discussed:

*Resolved*, That the New England Hardware Dealers' Association requests that the manufacturers of Builders' Hardware make no quotations of prices, nor give any estimates on contracts to any person, except he be a recognized dealer in Builders' Hardware, and that no quotation nor estimate be made such dealer on such work at less than said dealer can purchase the same goods for stock.

It was supposed that some action would be taken by each manufacturer and a written reply sent to the association. As no answers to our request have been received we earnestly desire you to give us your views on the subject.

In reply to this letter communications were received from a majority of those addressed, but they were in the main unsatisfactory. The replies were read by Secretary James A. Farless and discussed by the following members: Edward A. Loomis, George J. Mulhall, Blon C. Pierce and Calvin M. Nichols. Later, on motion of Ex-President William D. Parlin, it was voted "That the committee who have in charge the resolution sent to the manufacturers of Builders' Hardware be instructed to confer directly with the American Hardware Association either in writing or by sending delegates."

E. H. Collins, Boston, representing the Meriden Cutlery Company, was admitted to membership.

The Entertainment Committee of the evening were Austin H. Decatur, Ernest C. Howard and Elihu F. Turner, and acceptable music was furnished by Robert L. Van Buskirk and W. S. Moslarm.

The following Entertainment Committee for the October meeting was appointed: Henry M. Sanders, Boston; William E. Plumer, Somerville, and John Duncan, Boston.

#### Cincinnati Hardware Association.

The Cincinnati Hardware Association held their regular monthly meeting on the 11th inst., transacting considerable routine business. A committee was also appointed to make necessary preparations for the annual convention of the Ohio Hardware Association, which will be held in Cincinnati in February of next year. The committee is composed of energetic men, and they expect to get right down to work, as it is intended to make this the most interesting meeting in the history of the association. The local association will have the co-operation of all the business organizations of the city, and no effort will be spared to make the convention a memorable one.

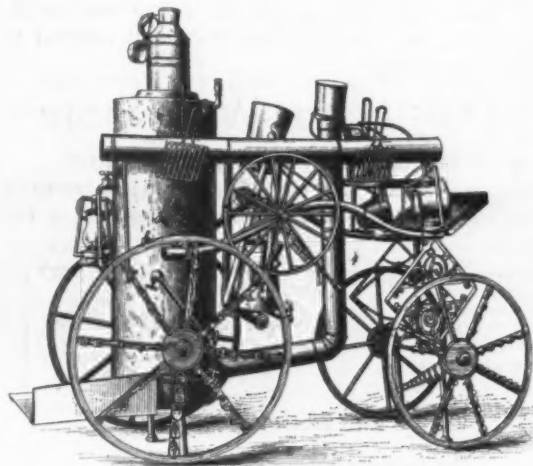
#### Canadian Wholesale Hardware Association.

One of the most interesting meetings in the history of the Canadian Wholesale Hardware Association was held at Quebec on the 13th and 14th inst. The organization is a very strong one and reports showed that it was in good condition. Messrs. Howland of Toronto, elected president; Starke of Montreal, elected vice-president, and Hardy of Toronto, elected secretary-treasurer, were delegated to represent the association at the approaching convention of the National Hardware Association of the United States. At the close of the convention a unanimous vote of thanks was tendered the National Association for having sent their secretary-treasurer, T. James Fernley, as a fraternal delegate to the meeting.

#### A Fire Engine.

The illustration herewith given represents a fire engine, made up of goods handled by Ford & Sanborn Company of Salinas City, Cal., and displayed in one of their show windows. The wheels are made of Draper Sticks for spokes, with tin rims, with Tin for hubs, and nickel plated Wall Flanges, together with Pipe Caps form the nuts and caps. The felloes and hubs were painted a light red. The spokes were trimmed with small articles of Hardware. The boiler was made of a piece of 5-foot Wire Netting covered with Building Paper. Attached to the boiler were Wash Tray Bibbs, Fuller and Pet Cock, also Lever Bibbs, Glass Water Tube and as many articles in that line as would add to the appearance of the boiler. For the smoke stack a Milk Can set on a Milk Pan was used. The whistle was made of a vertical Check Valve connected with a common nipple and elbow. Two Scythe Snaths were used for coupling rods to connect the boiler with the front wheels, fastened to the boiler with Hitch Rings and Staples. The pumps were two Tin Churns. At the bottom of the lower Churn two pieces of Lead Pipe were soldered to represent discharge pipes, with a Globe Valve at the end of one piece and a Bath Plug at the end of the other. A Leader Pipe

connected the boiler with the pump, representing a steam pipe. The fly wheel was a Toy Wagon wheel, while the lever used to throw the pump crank off the center was a pair of Bolt Clippers. The vacuum pipe was made of joints of Stove Pipe, with a Milk Can for a head. The suction pipe consisted of three joints of Stove Pipe, hung in two Wire Bread Toasters. The seat was formed of two Wash Boards joined together by Hinges. The springs under the seat were composed of Basin Brackets. Lead Pipe was used for seat arms. The seat rested upon Shelf Brackets fastened to the forward ends of the Scythe Snaths. A Drip Pan answered for the foot board, which was held in place by Shelf Brackets resting upon the front axle. The axle and king bolt were made of Pipe and Fittings. Three lanterns were hung in conspicuous places on the engine.



*Ford & Sanborn Company's Window Display.*

The idea of building the fire engine was conceived and elaborated by Harry M. Hudson, one of the employees of the establishment. The construction was ingenious, and the articles selected were well suited to carry out the idea.

#### Trade Items.

A RECENT issue of the Clinton (Iowa) *Daily Herald* contains the report of the Deputy Commissioner of the Bureau of Labor Statistics, relative to an inspection of the various factories of Clinton. In his report reference is made to the works of the United States Steel Lock Company as one of the two model institutions in the city worthy of pattern by manufacturers. The plant is referred to as a model place for workingmen, and the effect of these good conditions is seen in the faces of the company's employees.

F. J. MATTISON, 127 Duane street, New York, Eastern agent of the Fred. J. Myers Mfg. Company, Hamilton, Ohio, recently took for his company an order for several thousand Ticket Punches, the deliveries of which will extend for a year. He refers to this as the largest order of such a character he has ever taken.

R. P. BOYD of Knoxville, Tenn., has succeeded to the position recently vacated by T. H. Gossett, late of John H. Graham & Co., New York City, and will travel the same territory formerly visited by Mr. Gossett.

THE new buildings of the American Axe & Tool Company, now in course of erection at Glassport, Pa., are rapidly being put under roof. The company are anxious to have machinery placed and at least part of the works in operation by December 15. The concern have large orders on hand and expect to operate the new works steadily when they are completed.

F. A. SOUTHWICK, for many years advertising manager of the New Departure Bell Company, Bristol, Conn., is now connected in a similar capacity with the Goodell Company, Antrim, N. H., whose products of Cutlery, Apple Parers, &c., are well known to the trade. In addition to their line of high grade Cutlery, the company are now introducing a Bread Crumber for hotels, restaurants, &c., which is referred to as effecting an important saving in time and money, besides offering new possibilities in the cuisine.



## Trade Winning Methods.

*This department will contain a description of approved methods of bringing customers to the store by means of newspaper advertising, circulars and such special expedients and methods as are found useful by enterprising and progressive Hardwaremen.*

*A cordial invitation is extended to merchants to co-operate in the effort to make it suggestive and of practical use to the trade.*

### UNIQUE ADVERTISING.

The John E. Bassett & Co., of New Haven, Conn., pursue unique methods of advertising, but always in the best of taste. The business of this house was established in 1784, and they are therefore well entitled to the use of the phrase,

### Ye Olde Harde-Ware Store

which frequently appears on their printed matter.

BOOKLETS.—During the past few years the concern have issued a number of advertising circulars in the

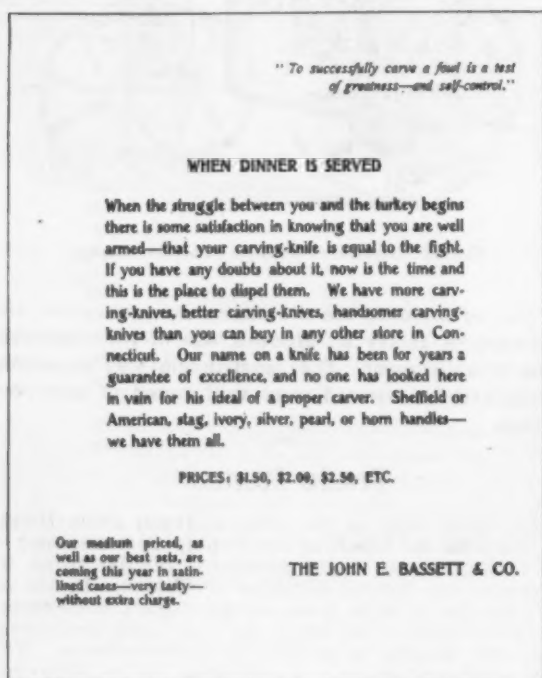


Fig. 1.—Page from Booklet.

form of booklets. One of them sent out last year was devoted to

*"Those things we know about, Being an Exposition of Sundry Well Known Facts, Both Old and New, and Now Collected and Written Down for the Enlightenment of the Young and the Edification of the Old," by The John E. Bassett & Co."*

Fig. 1 is a reduced reproduction of one of the pages of this booklet, and gives an excellent idea of the general style.

INTRODUCTION.—The first page was headed "Facts vs. Fiction," followed by an address to the public which was in part as follows:

The public has been treated to so much well-written fiction, so much imagination and amusing literature, on the band stand, the school question, and other interesting subjects that we feel that a few statements that are not fiction, that are not imaginative, that are not even amusing, would fill a long felt want.

GENERAL MAKE UP.—The following pages told of Pocket Knives, Table Cutlery, Sleds, Skates, Razors, Scissors, Chafing Dishes, Andirons and winter House Furnishings. These articles were all treated in an inter-

esting manner, and the quotations at the top of each page, with the note at the bottom, added not a little to the attractiveness of the pages.

DISTRIBUTION.—The envelopes in which the booklets were inclosed were directed as shown in Fig 2. Ten thousand of the booklets were sent out by special messenger and one was left at nearly every house in the city. This method of distribution has been pursued for several years, and has been found much less expensive and al-

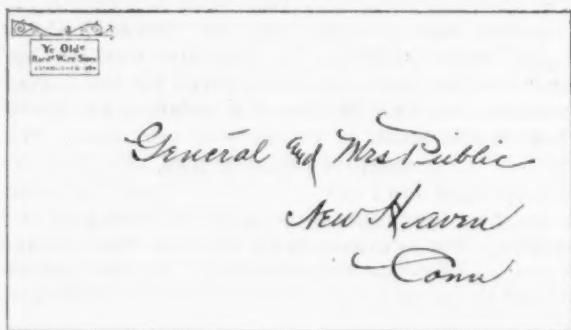


Fig. 2.—Envelope Inclosing Booklets.

most as effective as mailing. More families are probably reached in this way, as it would be almost impossible to make out a mailing list that would cover all the families that the concern wished to reach.

VARIETY.—Each year the booklet has been different in composition and appearance, though about the same lines of goods have been brought to the attention of customers, and the same general style of pages has been followed. One year a story of "Old Man Bluebeard"

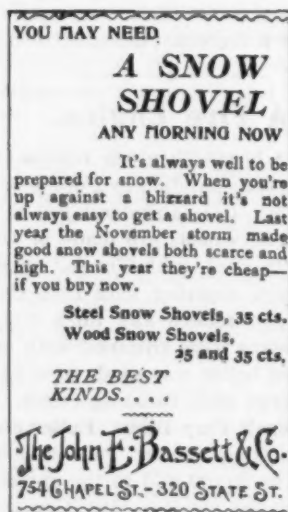


Fig. 3.—Sample of Newspaper Advertising.

occupied the first three pages, with his picture in colors on the front cover. Another year the cover and envelope were of brown straw paper.

For 1896 the subject of the booklet was "Mr. Janus, A Two Headed Tale." The front and back covers were the same, except that on one was printed "The face toward the north," and on the other, "The face toward

the east." Janus, it will be remembered, is represented as having two faces, one looking to the east and the other to the west. This story is made the basis of calling attention to the two entrances to their store, one on Chapel street, and the other on State street. The booklet reads from either end to the center, each part treating of the goods found in that end of the store.

The booklet for 1897 had as an introductory attraction "The Mystery of Methuselah, as Propounded by the John E. Bassett & Co."

**NEWSPAPER ADVERTISING.**—The other advertising of the concern is confined almost entirely to the newspapers and window displays, the advertisements being changed at least twice a week and the window displays once a week. The advertisement shown reduced in size in Fig. 3 gives an idea of the general style pursued in this line. The point is usually made of advertising in the papers whatever is displayed in the windows. This is considered to be the most effective way of advertising, and particular attention is paid to having the window displays as attractive as possible.

### SPECIAL LETTERS.

A prominent feature in the advertising methods of E. M. Austin, Litchfield, Ill., is special letters which are mailed to different classes of people whom he desires to interest in his offerings. The following is the form of letter sent to

#### Newly Married Couples.

Kind Friends:

I am pleased to know that your hearts have been joined together and your lives united in the holy bond of matrimony. I beg to offer you my sincere congratulations and to express the wish that a long life, full of happiness and prosperity, awaits you.

We always make a special reduction to all newly married couples which saves them several dollars and also brings to us their patronage. The saving will amount to from \$5.00 to \$15.00, according to the amount purchased. We sell all kinds of House-Furnishing Goods besides Stoves, such as Dishes, Glassware and everything used in the kitchen. Our Stoves are all fully warranted. My record for honest dealing can be learned from any business man on our street, and we will see that you are fully protected in any articles you get. Return it if not as we say. If you need but a few items call and get them, as we will give you a reduction on anything you need, no matter how little the purchase may be. Thanking you very kindly in advance for any favors you may see fit to bestow, I remain, with best wishes,

Yours very truly,

E. M. AUSTIN.

Twice each year about 500 letters are sent through the mail, accompanied by appropriate circulars, to those who are

#### Not Regular Customers.

Dear Sir:

I wonder if you are purchasing from me the bulk of your needs in my line? Kindly look over the inclosed circular. The quotations are not "Special bails" but samples of our regular prices all through the stock. Please notice the paragraph near top headed "Worth Reading Twice." The rebates referred to give you an additional discount of 2½ per cent. from our already low prices. The only store in our line that offers this. We also sell Buggies and Surreys on a very close margin.

Extending best wishes and the hope I may be favored with a call, I am

Yours very truly,

E. M. AUSTIN.

The following letter is sent to the parents five weeks after the

#### Birth of a Child.

Kind Friends:

Permit me to extend heartiest congratulations upon the arrival in your home of the tender little rosebud to gladden your hearts and lives. As you look into its tiny face and press its dainty lips to your own, it will be the means of cementing still firmer the bond of love that already binds you together.

Your needs for a child's Carriage can be supplied by me at a nominal sum, as we bought them before the present high prices took effect. Our styles are all the newest, having but recently added this line.

Thanking you in advance for the call I trust you will make, I remain, with best wishes,

Yours truly

E. M. AUSTIN.

Printed matter relating to Paints and Oils is sent out with this letter in the spring to

#### All Painters.

I inclose a little printed matter I thought you would be interested in reading. Kindly note remarks regarding White Lead and Oil on circular.

Our stock of Paints is very large. Although a new department, our sales have been double what we expected. Nothing but selling below others could have made this possible. We have Dry Colors, Colors in Oil, Varnish and Brushes, all grades. You do not have to ask for rebate checks. They are printed with a cash register after purchase is made, and the money cannot be placed in drawer without a rebate ticket being thrown out to you. We offer you but one bait. That is, same quality at lower prices than others. Kindly make us prove this, and oblige

Yours, with best wishes,

E. M. AUSTIN.

The accompanying cuts show the rebate checks referred to:

3569 JUN 21

We shall give a check like this with every cash purchase.

PAY CASH AND  
SAVE MONEY.

Cash will discount our bills, and we will discount yours.

WATCH THE BACK OF  
THESE CHECKS.

Front.

**H. M. Austin,**  
LITCHFIELD, ILL.  
Hardware, Vehicles,  
Harness, Bicycles, House  
Furnishing Goods, Glass,  
Paints, Oils and Baby  
Carriages.  
Lowest prices in the city.  
The amount of your  
purchase was

D Ch \$0.23

\$10 in checks returned  
good for 25c. in  
trade.

Back.

The checks are redeemed in amounts of \$10 and are worth, when returned, 25 cents in trade. The checks are numbered and dated, and the clerk's initial renders errors quickly found. It is remarked that as many persons lose the checks, the number returned is much smaller than those given out, and that the wholesale cost of the articles given in exchange for the checks is a very slight percentage of the \$10 worth of checks returned.

#### Letters Ready.

All the letters included in this article are written in advance on the typewriter, and are ready to mail at a moment's notice.

The following letter is prepared in this way with a blank space left to insert the name of an article which it is learned a party is thinking of purchasing. Upon learning what the article is, whether a Range, Bicycle, Carriage or something else, its name is inserted in the proper place and the letter

#### Mailed to the Person.

Dear Sir:

I learn that you are thinking of buying a soon. Permit me to call your attention to our large line of goods of this kind. Our sales of this line are very large because of the very low prices we quote. We are enabled to do this because we pay for every purchase on arrival of goods, which gives us an extra discount others do not obtain. Then, our expenses in proportion to our heavy sales are far less than our competitors. Our reputation as a spot cash buyer brings us special prices that the buyer on long time never sees. A dollar saved by close buying is that much extra profit. WE GIVE YOU THAT DOLLAR. I beg to inclose with this a sheet giving not "Special bargains," but samples of our regular prices all through the stock. Shall be pleased to have you call before making the purchase referred to above. Thanking you in advance for the call I trust you will make, I remain, with best wishes,

Yours very truly,

E. M. AUSTIN.

The following letter is sent to



**Market Gardeners.**

Dear Sir:

We beg to inclose a copy of Ferry's Wholesale Market Gardeners' Price-List. We will furnish you anything from this book, if on hand, at these prices and save you express charges and trouble in ordering. Kindly treat these low prices confidential, and oblige me by not showing the book to any one. By saving you express our price is lower to you than the seed houses.

Hoping you will see me before ordering, I remain,  
Yours truly,

E. M. AUSTIN.

**"Austin Has Failed"**

is the heading, in large letters, of a circular, 12 x 18 inches in size, copy of which was recently placed in every home in Litchfield, a city of 6500 inhabitants. The circular goes on to state that he has not failed financially, but has failed to convince a few people that he sells lower than others. The circular gives some illustrations, and the names of a large number of articles, with prices. Similar circulars are distributed every four or five months. In addition to placing them in homes, they are distributed every day by a boy, who puts one in each wagon tied at the public places in the city. The circulars are also handed to customers, with their change. These circulars are also inclosed in letters mailed to strangers, which frequently brings them to this store first. The letter, which is termed the

**Stranger's Letter,**

is as follows:

Dear Sir:

I learn you are a stranger within our gates and beg to extend a very cordial welcome to our city. A new resident is at a loss to know where to trade, for it is easy to fall into deceptive hands.

My reputation is an open book for all who will inquire into my record for honest dealings. Our stock as described on circular inclosed is very large. Any want, however small, will be filled at a very low price. Command my services if I can render you any information regarding our city.

With best wishes, and the hope I may soon have the pleasure of meeting you, I beg to remain,  
Yours very truly,

E. M. AUSTIN.

**Use of the Owl.**

These circular letters are written on the proprietor's regular letterhead, upon which is his name and the usual enumeration of goods carried in a Hardware store. In addition to this, in the upper left hand corner is a picture of an owl, a reproduction of which is herewith given:



The owl is conspicuous on all printed matter, including notes, receipts, advertisements, letters, remittance blanks, bill heads, and all special letters.

**An Advertising Scrap Book**

is kept, in which everything applicable to the business that is unique and novel is placed, until such times as use is found for the matter.

**Newspaper Advertising.**

Letters are not alone depended upon to encourage trade, but two papers, one a daily and the other a semi-

weekly, are used constantly as advertising mediums. A seven-inch triple column advertisement, including both papers, eight times a week, reaches about 3000 subscribers. The space used is always on the front page, and being surrounded entirely by reading matter, it is sure to catch the eye of all readers.

**Fence Signs.**

Last spring Mr. Austin had placed along the roads leading to the city 600 fence boards, which were donated by the manufacturers, the only cost being that of putting them up.

Mr. Austin advises us that the foregoing Trade Winning methods have proved successful, as since commencing to advertise the business in this manner, trade has increased 100 per cent.

**Price-Lists, Circulars, &c.**

FLINT & WALLING MFG. COMPANY, Kendallville, Ind.: Wind Mills, Pumps, &c. Catalogue No. 40 gives exterior and interior views of factory, details the growth of the business and illustrates the goods manufactured. Much attention is given to the adaptability of the Wind Mill to driving various machinery in connection with the farm, illustrations being given of transmitters, &c.

CLINTON WIRE CLOTH COMPANY, Clinton, Mass.: Clinton Sanitary Wire Mats. An illustrated folder elaborates the excellence of the Mats under these headings: Design, construction, wire, frame, sanitation, scraping surface, durability and economy, utility and adaptability.

IOWA FARMING TOOL COMPANY, Fort Madison, Iowa: Vest pocket memorandum book, containing also calendars for 1900, 1901 and 1902 and much general information.

THE BERRIDGE SHEAR COMPANY, Sturgis, Wis.: Illustrated circulars calling attention to their Pipe Snips and Double Cutting Snips and Pipe Crimpers. The Snips are intended to cut every kind of Sheet Metal Pipe, leaving the edges smooth and intact. The Double Cutting Snips and Pipe Crimpers are referred to as of special value in setting up stoves, furnaces and blow pipes, putting up eaves troughs, cutting flashings, putting up galvanized cornices, &c.

THE SIMPLEX ELECTRICAL COMPANY, Cambridgeport, Mass.: Electric Heating. Illustrations are shown in a catalogue of Electric Radiators, Foot Warmers, Rheostats, Car Heaters, Cooking Utensils, Ovens, Coil Heaters, Smoothing Irons, &c.

THE I-XL & GOSHEN PUMP COMPANY, Goshen, Ind.: Pamphlet devoted to their line of Kitchen Furniture, including Tables, Cabinets, single and double Cupboards, Sinks and Wardrobes. The company are also manufacturers of Screen Doors and Windows and Wood and Chain Pumps.

WEEKS SCALE WORKS, Buffalo, N. Y.: Weeks' Combination Beam U. S. Standard Scales for grain, coal, hay and cotton.

MANHATTAN BRASS COMPANY, First avenue and Twenty-eighth street, New York: Illustrated booklet showing Architectural Bronze and Brass Work manufactured by them. In it is illustrated Elevator Inclosures and Bronze Capitals, Counter and Bank Railings, Grilles for Vestibule Doors, Bronze Entrance Doors, Lanterns and Railings, Cashiers' Stands, Patent Coat Racks, Mirror Frames and other goods of this general character for fine office buildings and private residences.

HIBBARD, SPENCER, BARTLETT & Co., Chicago: A unique and attractive pamphlet, entitled "Wall and Window Displays of Fall and Winter Goods." It contains 12 half tone illustrations of Sample Boards of seasonable goods, together with some hints and suggestions concerning Hardware display advertising. The exhibits, which are fully described, relate to Axes, Cross Cut Saws, Enameled Ware, Cast Hollow Ware, Chopping Tools and Fruit, Lard and Jelly Presses, Lamps, Lanterns and Supplies, Fire Irons, &c., Stove Pipe, Elbows and Coal Hods, Stove Boards, Registers, Skates and Sporting Goods.

LOEB CARRIAGE COMPANY, Montgomery, Ala.: Catalogue relating to Carriage and Wagon Hardware, Blacksmiths' Supplies, Carriage and Wagon Wood Stock, Iron and Steel, Carriage Paints and Tools, and Machinery.

**MOSELEY & STODDARD MFG. COMPANY, Rutland, Vt.:** Catalogue No. 200. This is devoted to Silos, their advantages and construction. Illustrations are given of the new line of Green Mountain Silos. In this connection the makers call attention to the door and door frames. The door fits the frame on both a bevel and a rabbet, giving three distinct bearings and thus making, it is explained, an air tight joint an absolute certainty. The catalogue will be mailed upon application to the manufacturers.

### Among the Hardware Trade.

**Orange Hardware Company, Orange, Va.,** have been incorporated with a capital stock of \$5000. They handle Heavy and Shelf Hardware, Stoves, Tinware, Wagon and Carriage Materials, Agricultural Implements, Wagons and Buggies, Lime, Cement, &c.

**H. W. Jones & Bro., Hunnewell, Kan.,** who were burned out on February 18, 1899, and were succeeded by **W. C. Jones & Son,** succeeded the latter on the 15th ult., and are continuing business as heretofore.

**K. Almind** has sold out his interest in the Hardware firm of **Sharp & Almind, Long Beach, Cal.,** and the style has been changed to **Sharp & Campbell.**

**M. A. Masten** has succeeded **Silas H. Shields** in the Hardware business in **Washington, N. J.** The store is referred to as strictly up to date in its appointments.

**Rich Hardware Company** are successors to **J. J. Britt & Son, Siloam Springs, Ark.**

**Jolley, Washburn & Co., Milton, Iowa,** have dissolved partnership, and the Hardware business is now conducted under the style of **Jolley & Washburn.**

**Edward Sprankle** has disposed of his Hardware business at **Kendallville, Ind.,** to **Sprankle Hardware Company,** who continue at the old stand. **Mr. Sprankle** has identified himself with the **Janney Mfg. Company,** manufacturers of Farm Machinery, Ottumwa, Iowa.

**McNutt, Chandler & West** have succeeded **McNutt Brothers & Edington, Maryville, Tenn.**

**Miller & Miller** is the style of a new firm who have lately opened up in the Hardware business at **Sulphur Springs, Texas.**

**Shuey & Rider, Westfield, Ill.,** are about to move into a new two-story and basement brick storeroom, 72 x 23 feet.

**Kenyon Hardware Company, Kenyon, Minn.,** have dissolved, and **C. A. Petterson** is now carrying on the business under his own name.

**Philip Michael** has sold a half interest in his Hardware business in **Fremont, Ind.,** to **Earl Michael,** and the style of the firm has become **Philip Michael & Son.**

**Lemuel Brown** has purchased the Hardware and furniture business of **S. M. Arthur, in Arthur, Iowa.** **Mr. Brown** was formerly in the lumber business at **Lenox, Iowa.**

**T. De Booy** has sold his stock of Hardware, Stoves, Sporting goods, &c., **Allison, Iowa,** to **F. B. Merrill.**

**A. W. Comstock** has disposed of his wholesale and retail Hardware, Stove, Agricultural Implement and Sporting Goods business at **Alpena, Mich.,** to **B. R. Young.**

**C. E. Thomas** has lately embarked in business at **Willow Lake, S. D.,** carrying an entirely new stock, consisting of Shelf and Heavy Hardware, Stoves, Tinware, Bicycles and Athletic Goods.

**Aaron Stettler, Three Rivers, Mich.,** has disposed of his Hardware business to **Sherman G. Chard,** who has combined the goods with the **Henry Zearley** stock.

**King Hardware Company, Atlanta, Ga.,** have lately moved into larger and more commodious quarters. The reports which have appeared in the daily newspapers of the destruction of their establishment by fire were, we are advised, very much exaggerated, the fact being that their goods were not touched by fire, but only slightly damaged by water. As an illustration of the advantage

of keeping up with first-class insurance they state that within 20 hours of the breaking out of the fire the company had received five checks on loss from the insurance companies, who did not scale the company's estimate of the loss one cent.

**De Weese & Woodcock** have sold out their Hardware business in **Piqua, Ohio,** to **D. R. Burr & Co.**

On account of ill health, **J. F. Anderson** is closing out his Hardware, Stove and Plumbing business in **Lubec, Maine.**

**Wm. E. Furnas** has succeeded **J. N. Phillips, Amo, Ind.,** in the Hardware, lumber and saw mill business.

**Chenault & Orear** have succeeded **W. W. Reed & Co., Mt. Sterling, Ky.** **Mr. Chenault** was a member of the old firm, and **Mr. Orear** had been in their employ for the past five or six years.

**Keny & Coldwell** are successors to **Keny & Ambrister, dealers in Hardware, Stoves, Tinware, Agricultural Implements, Sporting Goods, &c., Maryville, Tenn.**

**Bettler & Otto** have dissolved partnership in the Hardware, Stove and Farm Implement business in **Wapello, Iowa,** and have been succeeded by **Hayden & Bettler.**

**E. E. Stewart Company, Limited,** have purchased the **Berry Hardware store at Halley, Idaho.** The store has been remodeled throughout, and the company are carrying a complete line of Shelf and Heavy Hardware, Stoves and Tinware, Sporting Goods and Mine Supplies.

**Mill & Blecha** are successors to **Hugh Bennett at Coal City, Ill.**

**T. F. Horner** has succeeded **Wallace & Horner** in the General Hardware and Farm Implement business in **Leon, Iowa.**

**Beucher & Nofzinger** have disposed of their Hardware and Agricultural Implement business in **Stryker, Ohio,** to **Sloan Bros.,** who continue at the old stand.

**Damon & Gould Company, Fitchburg, Mass.,** have commenced the erection of a new fire proof building on the site of the one destroyed by fire a few months since. The building will be five stories high in front and six stories in the rear, with basement. It will have a frontage of 45 feet and a depth of 102 feet. Flanking the main entrance on either side will be large show windows 13 feet wide by nearly 11 feet high. The first and second floors will be devoted to the retail business, the other floors being given up to the wholesale department. There will be two elevators, one for passengers and one for freight. The building will be lighted by electricity as well as gas. The whole building will be admirably adapted for the purpose for which it is being built, and nothing will be omitted which will go toward making it a most complete headquarters for this firm's business, which is constantly increasing.

**John K. Goodwin** has sold out his business in **Selma, Ala.,** to the **Kelley Hardware Company.**

**A. H. French, Trenton, Neb.,** is erecting a large brick building for his Hardware, Stove and Agricultural Implement business.

**Hines, Emboy & Hines** have succeeded **Hines & Emboy** in the retail Hardware and Farm Implement business in **Paradise, Texas.**

**J. G. Spruill & Co.** have succeeded **W. R. Davis, dealer in Hardware, groceries, &c., Fashion, Ga.**

**David W. Ray** has disposed of his business at **Edwardsburg, Mich.,** to **John Walker.**

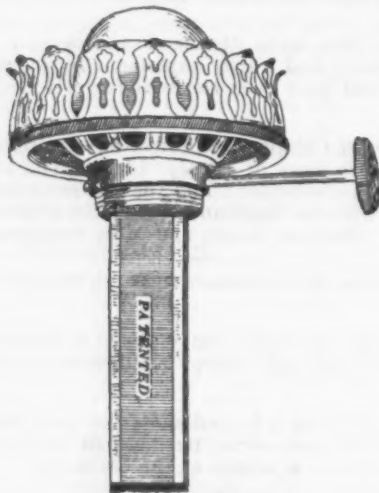
### G. S. Blodgett Company.

**G. S. Blodgett Company, Burlington, Vt.,** are offering their new cabinet oven, which, they state, has many novel features of improved construction added to those which have characterized the oven of the past, one of the strongest of which is the circulation of hot air. During the past two years a large number of these ovens have been furnished the United States War Department for use in Cuba and the Philippines. The oven is also adapted for core baking, japanning, enameling, &c., and is made in a number of sizes to meet various requirements.



### Incandescent Kerosene Lamp Burner.

A novelty that is being placed on the market by the Incandescent Burner Company, 19 Barclay street, New York, is an incandescent burner for use with lamps burning kerosene oil. The device, which is shown in the accompanying cut, is composed of two strips of copper and zinc, attached to the burner, through which the wick passes. The manufacturers claim that these, in combination with the sulphuric acid in the oil, form an automatic electric battery which utilizes the explosive matter in the oil, burning up the impurities and rendering explosion impossible, also preventing the discolored and freckled appearance of chimneys and removing the disagreeable odor of burning kerosene. The light also is more intense and the flame larger, while no more oil is consumed than by a common B burner, it is explained, giving a flame less than half the size. After using the burner a few times a carbon forms on the wick. This carbon, the manufacturers advise, should not be disturbed, as the wick will burn without trimming for

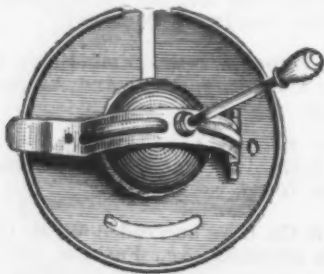


*Incandescent Kerosene Lamp Burner.*

10 or 12 weeks. The flame made by the burner is equal to 24 candle-power by actual test. The burner is made at present to fit any B collar lamp and takes a B wick and a No. 2 Electric chimney. Both smaller and larger sizes will shortly be on the market. The device has been patented in the United States, Canada, England, Belgium and Germany.

### Buchanan's Uniform Button Polisher.

Tower & Lyon, 95 Chambers street, New York, have just put on the market Buchanan's uniform button polisher, here illustrated. This consists of two metal disks



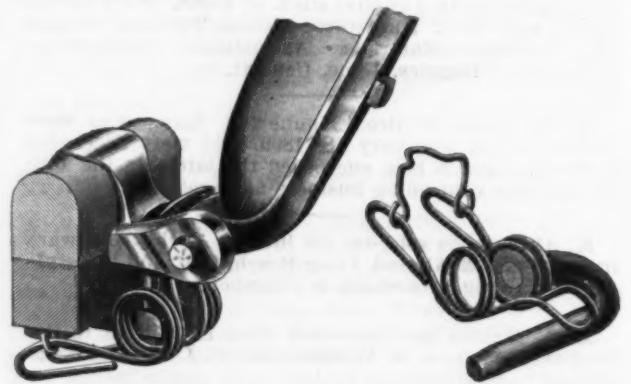
*Buchanan's Uniform Button Polisher.*

3½ inches in diameter, and is intended for polishing brass or metal buttons of any kind, such as are used on uniforms. It is especially suitable for the use of firemen, policemen, messengers, soldiers, members of societies or any who have buttons of this character which need polishing. In use the shield is placed between the button and garment by passing the eye of the button through the slot to the center of the shield. The shield is then closed by pushing the top disk back as far as the stop and shield will permit. The polishing device is hooked in the staple on the face of the shield, the other end being pressed down until the small pin on the shield passes through the other end of the yoke. The crank handle, on the other end of which is a cup shaped piece of metal to which is affixed a thick piece of polishing felt, is revolved to polish the button, using suitable powder for the purpose. After

a few quick turns the yoke can be removed and the button rubbed off with a soft rag of any kind.

### The Model Anti-Rattler and Quick Shift.

The Anderson Pole & Shaft Company, Anderson, Ind., are putting on the market the anti-rattler shown herewith. The bolts are of steel, tapered at the points sufficiently to insure easy passage through the shackle and shaft eye. The device is so constructed, it is remarked, that, should the spring break or, by accident, the latch become loosened from the clip bar, allowing the spring

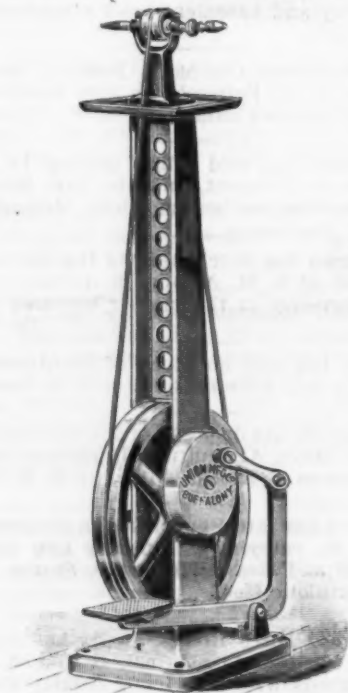


*The Model Anti-Rattler and Quick Shift.*

to drop, the bolt could not lose out. The bolts are secured to one coil of the spring at the side, as shown in the cut to the right. The general construction is such, it is stated, that the cost of manufacture is reduced to a remarkable degree. The device is referred to as neat in appearance, preventing rattling as effectually as any device applied to poles or shafts for this purpose, and as being quickly and easily attached or detached without the use of a wrench.

### Dental and Jewelers' Lathe.

The lathe shown herewith is put on the market by the Union Mfg. Company, Buffalo, N. Y. The machine has the company's improved tread with speed motor, driving the large balance wheel 3 to 1. The head is finely fitted, it is explained, and has adjustments for all wear. The spindle has a standard taper screw for



*Dental and Jewelers' Lathe.*

brushes, &c., while the other end has parting nuts for large wheels and split chuck for pin chucks, on which corundum wheels, drills and tools may be mounted. The machine is portable, weighing complete 70 pounds.

### American Beauty Design.

M. S. Benedict Mfg. Company, East Syracuse, N. Y., and 409 Broadway, New York, have recently brought out the American Beauty design in silver plated flat table ware, one of the teaspoons being here illustrated. This

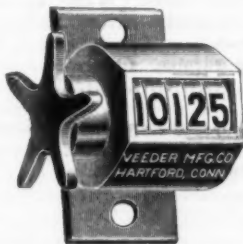


*American Beauty Design.*

design can be furnished in both standard and triple plate, in all the regular styles of tea and table spoons and forks, together with the customary assortment of fancy pieces. In the preparation of their new lines of goods for this season, in both flat and hollow ware, especial attention has been given to articles suitable for the hardware trade.

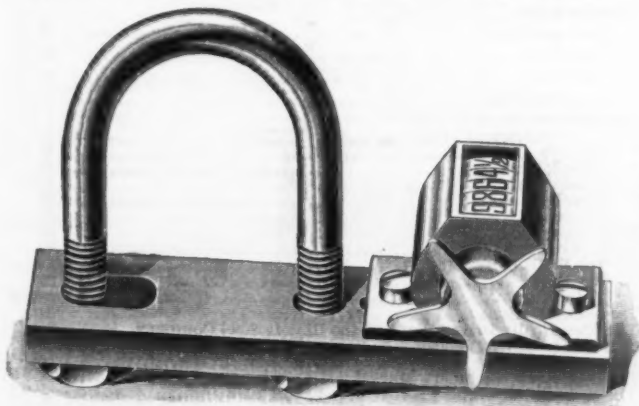
### The Veeder Odometer.

The Veeder Mfg. Company, Hartford, Conn., are offering odometers for automobiles and carriages, as



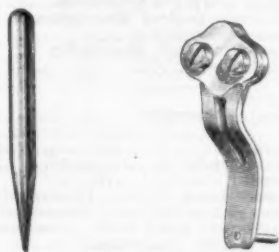
*Fig. 1.—The Veeder Odometer.*

shown in the accompanying cuts. The odometer, as illustrated in Fig. 1, is made with a flange base through which two holes are drilled to make it readily attachable



*Fig. 2.—Odometer with Attaching Fixtures.*

to any special clip which may be required. The makers remark that special clips are required on nearly every



*Fig. 3.—Odometer Strikers.*

different make of automobile, and if furnished with drawings they will make special attaching clips. The first row of figures on the odometer represents frac-

tions of a mile, the second row represents miles, the third tenths of miles, &c. The reading of the odometer illustrated is 1012½ miles. Fig. 2 shows the odometer with attaching fixtures complete. The striker to the left in Fig. 3 represents the hub pin for wooden wheels and the cut to the right the spoke pin for wire wheels.

Both strikers are supplied with every odometer. The manufacturers state that the mechanism employed in the odometers is positive and cannot skip or register too much unless first broken. The company are prepared to supply odometers for 15 sizes of wheels, from 24 to 50 inches, inclusive.

### The Virginia Rotary Washer.

The rotary washer shown in the accompanying cut is offered by the Richmond Cedar Works, Richmond, Va. The tubs are made of Virginia white cedar, corrugated on the sides and bottom. The hoops are galvanized wire electric welded. In operation, by turning the fly wheel, which weighs 18 pounds, the pin wheel or



*The Virginia Rotary Washer.*

dolly inside the tub is made to rotate in opposite directions. Attention is directed to the fact that the dolly rod passes up through the lid, thus giving large space through which to take clothes out.

### Hammock and Clothesline Hook.

E. H. Wilson & Co., Allston, Mass., are offering the malleable iron plate wire hammock and clothesline hook



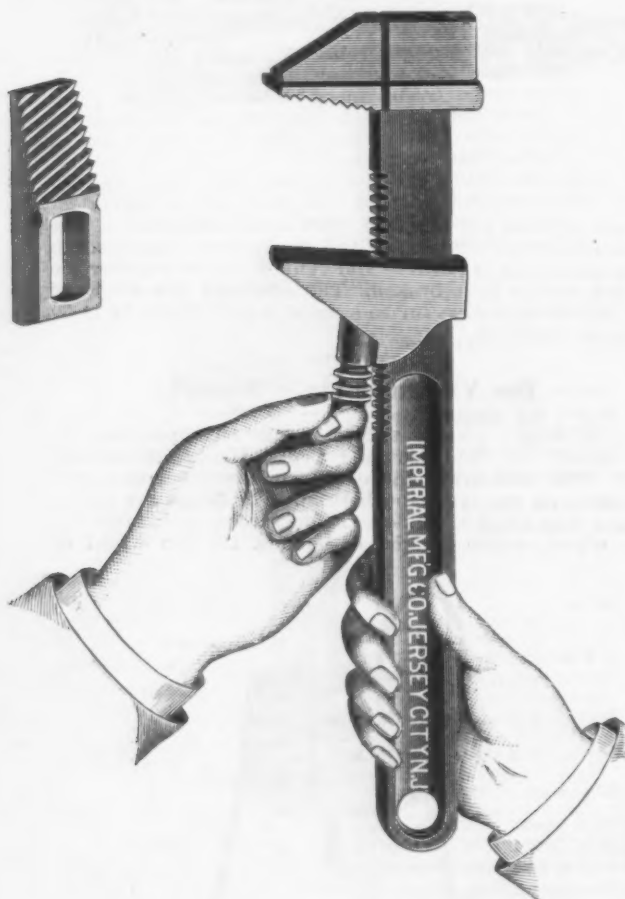
*Hammock and Clothesline Hook.*

shown herewith. The hooks are galvanized steel wire, warranted by the makers to stand the greatest strain. It is explained that they will not rust lines and that they are not susceptible to weather conditions.



### Hitt's Patent Adjustable Screw and Pipe Wrench.

The Imperial Mfg. Company, 142-156 Randolph avenue, Jersey City, N. J., are offering the wrench herewith illustrated, which is drop forged from steel. The adjustable jaw can be moved quickly by pulling out the screw from the rack, a spring at the back keeping the screw in place. For fine adjustment the screw can be used in the usual manner. The movable jaw is made

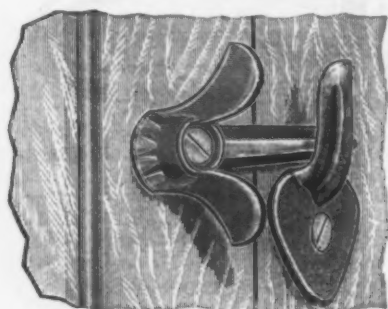


*Hitt's Patent Adjustable Screw and Pipe Wrench.*

of crucible steel to be used on pipe. It can be used against either the stationary or adjustable jaw, and grips on the tip ends of the teeth. It is explained, without breaking. The makers state that the wrench has the advantages of both a ratchet and screw wrench; that it can be adjusted to the smallest fraction of an inch instantly and with ease; that there are no parts to get out of order; that it will screw and unscrew nuts whose corners are worn off, and that it will work in close places and grip a square or round as small as  $\frac{1}{8}$  inch.

### The Fearn Casement Fast.

The Columbus Sash Ribbon Company, Columbus, Ohio, are offering the casement fastener herewith illus-



*The Fearn Casement Fast.*

trated. It is applicable to the right or left hand, top or bottom of a sash or door, and is applied with two screws. The fastener is designed for use on hinged sash in cellar,

attic or elsewhere, on sink and cupboard doors, chicken coops, harness closets and other small doors about a house and barn. It draws the sash or door to place, it is explained, even if sprung  $\frac{1}{4}$  inch, or it latches if the sash or door is shrunk or sagged. The fasteners are packed one set complete with screws in an envelope, one dozen sets in a pasteboard box, one gross sets in a case.

The Cumberland Hardware Company, Cumberland, Md., have removed from the building, 53 Baltimore street, which they were temporarily occupying, to that next door, No. 55. It consists of three floors, which have been specially fitted up to carry on their business of jobbing and retailing Hardware and Railroad and Mining Supplies.

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# Current Hardware Prices.

REVISED SEPTEMBER 18, 1900.

**General Goods.**—In the following quotations General Goods—that is, those which are made by more than one manufacturer, are printed in *Italics*, and the prices named represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. They apply to such quantities of goods as are usually purchased by retail merchants. Very small orders and broken packages often command higher prices while lower prices are frequently given to larger buyers.

**Special Goods.**—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

## Adjusters Blind—

Domestic,  $\frac{1}{2}$  doz. \$3.00.....33 $\frac{1}{2}$ ¢@39 $\frac{1}{2}$ ¢@10 $\frac{1}{2}$ ¢  
North's.....10 $\frac{1}{2}$ ¢  
Zimmerman's—See Fasteners, Blind.

## Window Stop—

Ives' Patent.....25 $\frac{1}{2}$ ¢  
Taplin's Perfection.....50 $\frac{1}{2}$ ¢

## Ammunition—See Caps, Cartridges, Shells, &c.

## Anvils—American—

Eagle Anvils..... $\frac{1}{2}$  doz. 7 $\frac{1}{2}$ ¢@7 $\frac{1}{2}$ ¢  
Hay-Budden, Wrought.....10 $\frac{1}{2}$ ¢@14 $\frac{1}{2}$ ¢  
Horseshoe brand, Wrought.....10 $\frac{1}{2}$ ¢@14 $\frac{1}{2}$ ¢  
Samson..... $\frac{1}{2}$  doz. 7 $\frac{1}{2}$ ¢@7 $\frac{1}{2}$ ¢  
Trenton, Wrought..... $\frac{1}{2}$  doz. 8 $\frac{1}{2}$ ¢@8 $\frac{1}{2}$ ¢  
Buel Pat. Trenton Wrought..... $\frac{1}{2}$  doz. 8 $\frac{1}{2}$ ¢@8 $\frac{1}{2}$ ¢  
Vulcan Wrought..... $\frac{1}{2}$  doz. 8 $\frac{1}{2}$ ¢@8 $\frac{1}{2}$ ¢

## Imported—

Armstrong's Mouse Hole.....8 $\frac{1}{2}$ ¢@9 $\frac{1}{2}$ ¢  
Peter Wright's.....9 $\frac{1}{2}$ ¢@9 $\frac{1}{2}$ ¢

## Anvil, Vise and Drill—

Millers Falls Co., \$18.00.....20 $\frac{1}{2}$ ¢

## Apple Parers—See Parers, Apple, &c.

## Aprons, Blacksmiths'—

Hull & Hoyt & Co.  
Lots of 1 d. doz.....25 $\frac{1}{2}$ ¢  
Small or Lots.....26 $\frac{1}{2}$ ¢  
Lots of 3 doz.....30 $\frac{1}{2}$ ¢

## Augers and Bits—

Common Double Spur, 60¢@10¢@10¢@70¢  
Boring Machine Augers.....60¢@10¢@10¢@70¢

## Car Bits, 12-in. twist—

Jennings' Pattern.....60¢@10¢@10¢@70¢

## Auger Bits—

Ford's Auger and Car Bits.....60¢@10¢@10¢@70¢

## Forester Pat. Auger Bits—

C. E. Jennings & Co.,  
No. 10 ext. tip, R. Jennings' List.....40 $\frac{1}{2}$ ¢  
No. 20, R. Jennings' List.....50 $\frac{1}{2}$ ¢  
Russell Jennings.....25 $\frac{1}{2}$ ¢@10 $\frac{1}{2}$ ¢  
L'Hommedieu Car Bits 15¢@10¢@15¢@10 $\frac{1}{2}$ ¢  
Puga's Black.....20 $\frac{1}{2}$ ¢  
Puga's enlignes' Pattern.....35 $\frac{1}{2}$ ¢  
Snell's Auger Bits.....60 $\frac{1}{2}$ ¢  
Snell's Bell Hangers' Bits.....50 $\frac{1}{2}$ ¢  
Snell's Car Bit, 12-in. twist.....60 $\frac{1}{2}$ ¢  
Wright's Jennings Bits (R. Jennings' List).....50 $\frac{1}{2}$ ¢

## Bit Stock Drills—

Standard List.....65¢@55¢@55¢

## Expansive Bits—

Clark's small, \$18; large, \$26.....60¢@10 $\frac{1}{2}$ ¢  
Lavigne's Clark's Pattern, No. 1.....20 $\frac{1}{2}$ ¢  
No. 2, \$18.....20 $\frac{1}{2}$ ¢  
C. E. Jennings & Co., Steer's Pat.....33 $\frac{1}{2}$ ¢  
Swan's.....60 $\frac{1}{2}$ ¢

## Gimlet Bits—

Common Double Cut, gro. \$2.75@3.25  
German Pattern.....gro. \$5.00@5.50  
Double Cut, makers' lists.....50¢@50¢@10 $\frac{1}{2}$ ¢

## Hollow Augers—

Ames.....25¢@10 $\frac{1}{2}$ ¢  
Bonney's Adjustable,  $\frac{1}{2}$  doz.....\$16.00  
New Patent.....25¢@10 $\frac{1}{2}$ ¢  
Universal.....20 $\frac{1}{2}$ ¢

## Ship Augers and Bits—

Ford's.....40 $\frac{1}{2}$ ¢  
Swell's.....40 $\frac{1}{2}$ ¢  
C. E. Jennings & Co.,  
L'Hommedieu's.....15¢@10 $\frac{1}{2}$ ¢  
Watrous'.....40 $\frac{1}{2}$ ¢

## Awl Hafts, See Hafts, Awl.

## Awls—

Brad Awls:  
Handled.....gro. \$2.75@3.10  
Unhandled, Shouldered, gro. \$3.50@3.90  
Unhandled, Patent.....gro. 65¢@70¢

## Peg Awls—

Unhandled, Patent.....gro. 51¢@51¢  
Unhandled, Shouldered, gro. 65¢@70¢

## Scratch Awls—

Handled, Common.....gro. \$3.50@4.00  
Handled, Socket.....gro. \$11.50@12.00

## Awl and Tool Sets—See Sets, Awl and Tool.

## Axes—

First Quality, best brands, \$6.25@6.50  
First Quality, other brands \$6.00@6.25  
Jobbers' Special Brands:  
Good Quality.....\$5.00@5.50  
Best Quality.....\$6.25

Cheap, Handled Axes.....\$5.50@5.75  
Beveled, add 25¢ doz.

## Axle Grease—See Grease, Axle.

## Axles—

Concord, Loose Collar.....5¢  
Concord, Solid Collar.....5 $\frac{1}{2}$ ¢  
No. 1 Common.....3 $\frac{1}{2}$ ¢  
No. 1  $\frac{1}{4}$  Com. New Style.....4 $\frac{1}{2}$ ¢  
No. 2, Solid Collar.....7 $\frac{1}{2}$ ¢  
Nos. 7, 8, 11 to 14.....7 $\frac{1}{2}$ ¢  
Nos. 15 to 18.....6 $\frac{1}{2}$ ¢  
Nos. 19 to 23.....7 $\frac{1}{2}$ ¢@10 $\frac{1}{2}$ ¢

## Boxes, Axle—

Common and Concord, not turned.....15¢  
Common and Concord, turned, lb. 10¢  
Half Patent.....lb. 9¢

## Balances—

Caldwell new list.....50 $\frac{1}{2}$ ¢  
Poulman's.....60 $\frac{1}{2}$ ¢

## Spring—

Spring Balances.....50¢@50 $\frac{1}{2}$ ¢  
Chatillon's Light Spring Balances.....40¢@10 $\frac{1}{2}$ ¢  
Chatillon Straight Balances.....40 $\frac{1}{2}$ ¢  
Chatillon Circular Balances.....50 $\frac{1}{2}$ ¢  
Chatillon's Large Dials.....30 $\frac{1}{2}$ ¢  
Peacock's.....50 $\frac{1}{2}$ ¢

## Barb Wire—See Wire, Barb.

## Bars—

Steel Crowbars, 10 to 40 lb., per lb.....3 $\frac{1}{2}$ ¢@3 $\frac{1}{2}$ ¢

## Beams, Scale—

Scale Beams, List Jan. 18, '88.....30¢@30 $\frac{1}{2}$ ¢  
Chatillon's No. 1.....30 $\frac{1}{2}$ ¢  
Chatillon's No. 2.....40 $\frac{1}{2}$ ¢

## Beaters—Egg—

Standard Co.,  
No. 5 Steel Handle Diver,  $\frac{1}{2}$  gro. \$6.50  
No. 10 Cast Handle Diver,  $\frac{1}{2}$  gro. \$8.00  
No. 10 St. el Handle Diver,  $\frac{1}{2}$  gro. \$8.00  
No. 15 Extra Heavy Steel Handle,  $\frac{1}{2}$  gro. \$15.00  
Rival,  $\frac{1}{2}$  gro. \$11.00  
Taplin Mfg. Co.,  
No. 50 Small Family size.....\$7.50  
No. 100 Regular Family size.....\$3.00  
No. 102 Regular Family size tinned.....\$9.50  
No. 150 Large Family size.....\$15.00  
No. 154 Large Family size, tinned.....\$17.00  
Lyons, Standard size.....\$7.75  
Wonder (S. S. & Co.).....\$7.50

## Bellows—

Blacksmith, Standard List, 70¢@70 $\frac{1}{2}$ ¢  
C. E. Jennings & Co., Blacksmith.....60 $\frac{1}{2}$ ¢  
C. E. Jennings & Co., Hand.....33 $\frac{1}{2}$ ¢

## Blacksmiths—

Inch.....30 32 34 36 38 40  
Eac 1, \$3.70 5.95 4.55 5.10 5.70 6.55  
Extra Length:  
Each, \$4.25 4.85 5.40 5.95 6.30 7.95

## Molders—

Inch.....9 10 11 12 14 16  
Doz.....\$6.75 7.25 8.50 9.50 12.00 14.50

## Hand—

Inch.....6 7 8 9 10 12  
Doz.....\$3.75 4.25 4.50 5.00 5.75 6.75

## Bells—

Ordinary goods.....75¢@10 $\frac{1}{2}$ ¢  
High grade.....70¢@70 $\frac{1}{2}$ ¢  
Jersey.....75¢@75 $\frac{1}{2}$ ¢  
Texas Star.....60¢@10 $\frac{1}{2}$ ¢

## Door—

Abbe's Gong.....45¢  
Barton Gong.....55¢  
Gong, Yankee.....55¢  
Home, R. & E. Mfg. Co.'s.....60¢@10 $\frac{1}{2}$ ¢  
Lever and Pull, Sargent's.....20¢@10 $\frac{1}{2}$ ¢

## Hand—

Hand Bells, Polished.....65¢@65 $\frac{1}{2}$ ¢  
White Metal.....65¢@65 $\frac{1}{2}$ ¢  
Nickel Plated.....50¢@51¢  
Silver.....60¢@60 $\frac{1}{2}$ ¢  
Silver Chrome.....85¢@85 $\frac{1}{2}$ ¢

## Miscellaneous—

Farm Bells.....lb. 2¢@3¢  
Steel Alloy Church and School.....50¢@50 $\frac{1}{2}$ ¢  
Wilnot & Hobbs Mfg. Co., Gongs.....70 $\frac{1}{2}$ ¢

## Belt—

Common Standard.....70¢@10¢@75¢  
Standard.....60¢@10¢@70¢  
Extra.....60¢@60 $\frac{1}{2}$ ¢  
High Grade.....60¢@60 $\frac{1}{2}$ ¢

## Leather—

Extra Heavy, Short Lap.....50¢@10¢@50¢@10 $\frac{1}{2}$ ¢

**Cut Prices.**—In the present condition of the market there is a good deal of cutting of prices by the jobbing trade, whose quotations are often lower than those of the manufacturers.

**Names of Manufacturers.**—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE INDEX SUPPLEMENT (May 3, 1900), which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

**Standard Lists.**—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

**Additions and Corrections.**—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Regular Short Lap.....60¢@60 $\frac{1}{2}$ ¢@10 $\frac{1}{2}$ ¢  
Standard.....60¢@10¢@60 $\frac{1}{2}$ ¢@10 $\frac{1}{2}$ ¢  
Light Standard.....70 $\frac{1}{2}$ ¢

## Cotton—

Rosendale-Reddaway B. & H. Co.,  
Sphinx Brand.....60¢@10 $\frac{1}{2}$ ¢  
Durable Brand.....70 $\frac{1}{2}$ ¢

## Bench Stops—See Stops, Bench

## Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters.....20 $\frac{1}{2}$ ¢  
Stoddard's Lightning Tire Upsetters.....40¢@50 $\frac{1}{2}$ ¢

## Bicycle Goods—

John S. Long's Son's 1899 List:  
Chain.....50 $\frac{1}{2}$ ¢  
Eddy's steel.....50 $\frac{1}{2}$ ¢  
Spokes.....50 $\frac{1}{2}$ ¢  
Tub.....60 $\frac{1}{2}$ ¢

## Bits—

Auger, Gimlet, Bit Stock Drills, &c.—  
See Augers and Bits.

## Bit Holders—See Holders.

## Blind Adjusters—See Adjusters, Blind.

## Blind Fasteners—See Fasteners, Blind.

## Blind Staples—See Staples, Blind.

## Blocks—Tackle—

Common Wooden.....70¢@70 $\frac{1}{2}$ ¢  
Cleave and Steel.....50¢@10¢@60 $\frac{1}{2}$ ¢  
Eddy's steel.....60 $\frac{1}{2}$ ¢  
Harris Steel.....50¢@10 $\frac{1}{2}$ ¢  
Ford's Star Brand Self Lubricating.....60¢@10 $\frac{1}{2}$ ¢

## Hollow Steel, Ford's Pat. Star Brand.....

## Lane's Patent Automatic Lock and Junior.....

Stowell's Novelty, Mail Iron.....50 $\frac{1}{2}$ ¢  
See also Machines, Hoisting.

## Boards, Stove—

Zinc, Crystal, &c.....50¢@10 $\frac{1}{2}$ ¢

## Boils—

Carriage, Machine &c.—  
Common, list Jan. 31, '95.....70¢@10¢@75¢  
Norway Iron, \$3.00, list Oct. 7, '84.....75¢@75 $\frac{1}{2}$ ¢

## Phil. Eagle, \$3.00 list May 24, '99.....

Bolt Ends, list Jan. 30, '95.....70¢@10¢@70 $\frac{1}{2}$ ¢  
Machine, list Oct. 1, '99.....75¢@75 $\frac{1}{2}$ ¢

## NOTE.—Jobbers' prices on Boils are now often lower than manufacturers', and the market is irregular.

## Door and Shutter—

## Cast Iron Barrel, Round Brass Knob—

Inch.....3 4 5 6 8  
Per doz.....\$0.35 36 45 57 80

## Cast Iron Spring Foot—

Inch.....6 8 10  
Per doz.....\$1.00 1.25 1.75

## Cast Iron Chain, Flat, Japanned—

Inch.....6 8 10  
Per doz.....\$0.85 1.20 1.50

## Cast Iron Shutter, Brass Knobs—

Inch.....6 8 10  
Per doz.....\$0.60 90 1.15

## Wrought Barrel Brass Knob—

Inch.....3 4 5 6 8  
Per doz.....\$0.44 50 61 70 1.23

## Wrought Barrel.....

Wrought "Bronzed," 40¢@50¢@10 $\frac{1}{2}$ ¢  
Wrought Flush, B. K., 50¢@10¢@60 $\frac{1}{2}$ ¢  
Wrought Shutter.....40¢@10¢@60 $\frac{1}{2}$ ¢  
Wrought Square Neck.....50¢@50 $\frac{1}{2}$ ¢  
Wrought Sunk.....50¢@50 $\frac{1}{2}$ ¢  
Ives' Patent Door.....60 $\frac{1}{2}$ ¢

## Stove and Plow—

Plow.....50¢@10¢@60 $\frac{1}{2}$ ¢  
Stove.....67 $\frac{1}{2}$ ¢

## Tire—

Common.....65¢@65 $\frac{1}{2}$ ¢  
American Screw Company,  
Norway Phila., list Oct. 16, '84.....75¢  
Eagle Phila., list Oct. 16, '84.....77 $\frac{1}{2}$ ¢  
Bay State, list Dec. 28, '89.....85¢  
Franklin Moore Co.,  
Norway Phila., list Oct. 16, '84.....75¢  
Eagle Phila., list Oct. 16, '84.....77 $\frac{1}{2}$ ¢  
Eclipse, list Dec. 28, '9.....85¢  
Port Chester Bolt & Nut Company  
Empire, list Dec. 28, '99.....85¢  
Keystone Phila., list Oct. '84.....77 $\frac{1}{2}$ ¢  
Norway Phila., list Oct. '84.....75¢

## Borers, Tap—

Borers Tap, Ring, with Handle:

Inch.....1 1 $\frac{1}{2}$  1 $\frac{3}{4}$  2 2 $\frac{1}{2}$  3 3 $\frac{1}{2}$  4 4 $\frac{1}{2}$  5 5 $\frac{1}{2}$  6 6 $\frac{1}{2}$  7 7 $\frac{1}{2}$  8 8 $\frac{1}{2}$  9 9 $\frac{1}{2}$  10 10 $\frac{1}{2}$  11 11 $\frac{1}{2}$  12 12 $\frac{1}{2}$  13 13 $\frac{1}{2}$  14 14 $\frac{1}{2}$  15 15 $\frac{1}{2}$  16 16 $\frac{1}{2}$  17 17 $\frac{1}{2}$  18 18 $\frac{1}{2}$  19 19 $\frac{1}{2}$  20 20 $\frac{1}{2}$  21 21 $\frac{1}{2}$  22 22 $\frac{1}{2}$  23 23 $\frac{1}{2}$  24 24 $\frac{1}{2}$  25 25 $\frac{1}{2}$  26 26 $\frac{1}{2}$  27 27 $\frac{1}{2}$  28 28 $\frac{1}{2}$  29 29 $\frac{1}{2}$  30 30 $\frac{1}{2}$  31 31 $\frac{1}{2}$  32 32 $\frac{1}{2}$  33 33 $\frac{1}{2}$  34 34 $\frac{1}{2}$  35 35 $\frac{1}{2}$  36 36 $\frac{1}{2}$  37 37 $\frac{1}{2}$  38 38 $\frac{1}{2}$  39 39 $\frac{1}{2}$  40 40 $\frac{1}{2}$  41 41 $\frac{1}{2}$  42 42 $\frac{1}{2}$  43 43 $\frac{1}{2}$  44 44 $\frac{1}{2}$  45 45 $\frac{1}{2}$  46 46 $\frac{1}{2}$  47 47 $\frac{1}{2}$  48 48 $\frac{1}{2}$  49 49 $\frac{1}{2}$  50 50 $\frac{1}{2}$  51 51 $\frac{1}{2}$  52 52 $\frac{1}{2}$  53 53 $\frac{1}{2}$  54 54 $\frac{1}{2}$  55 55 $\frac{1}{2}$  56 56 $\frac{1}{2}$  57 57 $\frac{1}{2}$  58 58 $\frac{1}{2}$  59 59 $\frac{1}{2}$  60 60 $\frac{1}{2}$  61 61 $\frac{1}{2}$  62 62 $\frac{1}{2}$  63 63 $\frac{1}{2}$  64 64 $\frac{1}{2}$  65 65 $\frac{1}{2}$  66 66 $\frac{1}{2}$  67 67 $\frac{1}{2}$  68 68 $\frac{1}{2}$  69 69 $\frac{1}{2}$  70 70 $\frac{1}{2}$  71 71 $\frac{1}{2}$  72 72 $\frac{1}{2}$  73 73 $\frac{1}{2}$  74 74 $\frac{1}{2}$  75 75 $\frac{1}{2}$  76 76 $\frac{1}{2}$  77 77 $\frac{1}{2}$  78 78 $\frac{1}{2}$  79 79 $\frac{1}{2}$  80 80 $\frac{1}{2}$  81 81 $\frac{1}{2}$  82 82 $\frac{1}{2}$  83 83 $\frac{1}{2}$  84 84 $\frac{1}{2}$  85 85 $\frac{1}{2}$  86 86 $\frac{1}{2}$  87 87 $\frac{1}{2}$  88 88 $\frac{1}{2}$  89 89 $\frac{1}{2}$  90 90 $\frac{1}{2}$  91 91 $\frac{1}{2}$  92 92 $\frac{1}{2}$  93 93 $\frac{1}{2}$  94 94 $\frac{1}{2}$  95 95 $\frac{1}{2}$  96 96 $\frac{1}{2}$  97 97 $\frac{1}{2}$  98 98 $\frac{1}{2}$  99 99 $\frac{1}{2}$  100 100 $\frac{1}{2}$  101 101 $\frac{1}{2}$  102 102 $\frac{1}{2}$  103 103 $\frac{1}{2}$  104 104 $\frac{1}{2}$  105 105 $\frac{1}{2}$  106 106 $\frac{1}{2}$  107 107 $\frac{1}{2}</$



**Carpet Stretchers—**

See stretchers, Carpet.

**Cartridges—**

B. B. Caps, Con., Ball Sngl., \$1.90

B. B. Caps, Round Ball, \$1.12 @ 1.18

**Blank Cartridges—**

22 C. F., \$5.60 10c 55

22 C. F., \$7.01 10c 55

22 cal. Rim, \$1.50 10c 55

22 cal. Rim, \$2.75 10c 55

Central Fire 25c

Pistol and Rifle 15c 55

Primed S. &amp; B. Bullets 15c 55

Rim Fire Sporting 50c

Rim Fire, Military 15c 55

**Castors—**

Bed 60c 10c 10 @ 70c

Plate 60c 10c 10 @ 60c 10c 55

Philadelphia 70c 10c 10 @ 70c 10c 10c

Boss 70c 10c 10

Boss Anti-Friction 70c 10c 10

Martin's Patent (Phoenix) 45c

Payson's Anti-Friction Furniture 70c 10c 10

Payson's Anti-Friction Truck 70c 10c 10

Standard Ball Bearing 45c

Tucker's Patent, low 30c

**Cattle Leaders—**

See Leaders, Cattle.

**Chain—**

American Coil, Full Casks:

3-16 4-16 5-16 6-16 7-16 8-16 9-16

7.25 5.35 4.35 3.50 3.35 3.25 3.15

4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

Less than Cask lots add 40c per 10 lbs.

German Coil, list July 24, '97, 60c 10c 10c

German Hailer Chain, list July 24, '97, 60c 10c 10c

Traces, Western Standard: 100 pair

6-1/2-8-2, Straight, with ring, \$26.00

6-1/2-8-2, Straight, with ring, \$27.00

6-1/2-8-2, Straight, with ring, \$31.00

6-1/2-10-2, Straight, with ring, \$35.00

Add 2c per pair for Hooks

Twist Traces 2c per pair higher than

Straight Link.

Trace, Wagon and Fancy Chains,

list April, '98, 60c 10c 10c

Jack Chain, list July 10, '98, 60c 10c 10c

Iron 60c 10c 10c

Brass 60c 10c 10c

Safety Chain 60c 10c 10c

Gal. Pump Chain 1b 55c 45c

Covert Sash Works

Breast, Hitching and Rein Chains, 50c

Covert Mfg. Co.:

Breast 35c 25c

Halter 35c 25c

Heel 35c 25c

Klein 35c 25c

Stallion 35c 25c

Onida Company:

Eureka Coll and Halter 60c 10c 55c

Niazara Coll and Halter 60c 10c 55c

Niazara Cow Ties 45c 55c 45c 10c 55c

Am. Cow Ties 50c 10c 55c 40c

Am. Cow Ties 35c 55c 40c 55c

Wire Goods Co.:

Dog Chain 60c

Universal Jbi-Jointed Chain 45c

Chalk—(From Jobbers.)

Carpenters', Blue 60c 10c

Carpenters', Red 60c 10c

Carpenters', White 60c 10c

See also Crayons.

Chalk Lines—See Lines.

**Checks, Door—**

Barley's 40c 10c

Columbia 50c 10c

Eclipse 60c 10c 10c

**Chests, Tool—**

American Tool Chest Co.:

Boys' Chests, with Tools 55c

Youth's Chests, with Tools 45c

Gentlemen's Chests, with Tools 45c

Farriers', Carpenters', etc., Chests, with Tools 20c

Machinists' and Pipe Fitters' Chests, Empty 20c

C. E. Jennings &amp; Co.'s Machinists' Tool Chests 25c 25c 10c

**Chisels—**

Socket Framing and Firmer

Standard List 75c 75c 10c

Buck Bros. 30c

Charles Buck 30c

C. E. Jennings &amp; Co. Socket Firmer No. 10 60c 10c

C. E. Jennings &amp; Co. Socket Framing No. 15 60c 10c

Swan 70c 55c

L. &amp; J. White 90c 30c 25c

Tanged—

Tanged Firmers 40c 55c 40c 10c

Buck Bros. 30c

Charles Buck 30c

C. E. Jennings &amp; Co. No. 14, 151, 25c

L. &amp; J. White, Tanged 25c 55c

Cold—

Cold Chisels, good quality, ab. 15c 10c

Cold Chisels, fair quality 1b. 12c

Cold Chisels, ordinary 1b. 8c 30c

Chucks—

Bench Pat., each \$8.00 30c

Skinner Patent Chucks:

Combination Lathe Chucks 40c

Drill Chucks, Patent and Standard 30c

Drill Chucks, New Model 40c

Independent Lathe Chucks 40c

Improved Planer Chucks 30c

Universal Lathe Chucks 40c

Face Plate Jaws 35c

Standard Tool Co.:

Improved Drill Chuck 45c

Union Mfg. Co.:

Combination 40c

Czar Drill 30c

Geared Scroll 30c

Independent 40c

Union Drill 40c

Universal 40c

Face Plate Jaws 35c

Clamps—

Adjustable, Hammers' 20c 20c 55c

Adjustable, Stearns' 30c

Cabinet, Sargent's 45c 10c

Carriage Makers' P. S. &amp; W. Co. 40c 10c

Carriage Makers' Sargent's 50c 10c

Beav. Parallel 35c 10c

Lineman's, Udea Drop Forge &amp; Tool Co. 40c

Saw Clamps, see Vises, Saw Fliers.

**Cleaners Walk—**

Star Socket, All Steel, \$4.00 net

Star Shank, All Steel, \$3.75 net

W. &amp; L. G. S. Sock, All Steel, 7 1/2 in. d. x 1 1/2 in. l., \$3.35; 8 in., \$3.40; 8 1/2 in., \$3.50.

**Cleavers, Butchers'—**

Foster Bros. 30c

New Haven Edge Tool Co.'s 40c 10c

Nichols Bros., Flat hdl., 30c; rd. hdl., 40c

Fayette R. Plumb. 25c 55c 10c

P. S. &amp; W. 35c 55c 35c 10c

L. &amp; J. White 25c

**Clippers—**

Chicago Flexible Shaft Company:

Handy Toilet, \$7.00

Mascoite Toilet, \$8.40

Monit Toilet, \$9.00

Stewart's Patent, \$10.00

**Clips, Axle—**

Eagle and Superior 1/4 and 5-16

inch, 70c 10c

Norway, 1/4 and 5-16 inch, 65c 10c 7c

Cloth and Netting, Wire

—See Wire, etc.

**Cocks, Brass—**

Hardware list (Globe, Kerosene,

Lever Bibbs, Racking, etc.), 70c 55c 10c

Coffee Mills—See Mills, Coffee.

**Collars Dog—**

Brass, Pope &amp; Stevens' list, 40c

Embossed, Gilt, Pope &amp; Stevens' list, 30c 10c

Leather Pope &amp; Stevens' list, 40c

**Compasses, Dividers, &c.—**

Ordinary Goods 70c 10c 75c

Bemis &amp; Cail Hdw. &amp; Tool Co.:

Dividers 65c

Calipers, Call's Patent Inside 55c

Calipers, Double 65c

Calipers, Inside or Outside 65c

Calipers, Wing 60c

Compasses 50c

J. Stevens A. &amp; T. Co. 25c 10c

**Conductor Pipe, Galva-**

nized—

Carload, L. C. L.

Loose, N. E. L.

Eastern, 60c 25c 55c 60c 20c 14c

Central, 60c 25c 55c 60c 17c 14c

Southern, 60c 20c 55c 60c 15c

S. Western, 60c 20c 55c 60c 12c 14c

Terms 25c for cash.

See also Eave Trough.

**Coolers, Water—**

Nos. 1 3 4 6

Labrador \$11.50 \$14.00 \$17.50 \$20.00

8 gal.

\$2.00

Nos. 3 4 6 8

Iceland \$23.00 \$25.00 \$30.00 \$37.50

10 14 gal.

\$37.00 \$42.00

**Coopers' Tools—**

See Tools, Coopers'.

**Cord—**

Sash—

Braided, Drab, 1b. 25c

Braided, White, Common, 1b 17 1/2 @ 10c

Cable Laid Italian, 1b. A, 18c; B, 16c

Common India, 1b. 8c 55c

Cotton Sash Cord, Twisted, 1b 10c

Patent Russia, 1b. 12c 10c

Cable Laid Russia, 1b. 12c 10c

India Hemp, Braided, 1b 15c 10c

India Hemp, 1b 15c 10c

Patent India, 1b 10c 10c

Pearl Braided, cotton, 1b 10c 10c

Massachusetts, White, 1b 22c 10c

Massachusetts, D. ab. 1b 20c 10c

Eddystone Braided Cotton, 1b 19c

Hardy Cable Laid Italian, 1b 18c

Oswego Mills:

Crown, Solid Braided White, 1b 18c

Braided, Giant, White, 1b 17c

Fee less:

Cable Laid Italian 10c

Cable Laid Russia 14c

Cable Laid India 12c

Braided India 12c

Phoenix, White, 10c

Samson:

Braided, Drab Cotton 1b 32c 10c

Braided, Italian Hemp 1b 32c 10c

Braided, Linon 1b 40c

Braided, White Cotton, Spot, 1b 28c 10c

**Silver Lake:**

A quality, Drab, 40c 15c

A quality, White, 35c 15c

B quality, Drab, 35c 15c

B quality, White, 30c 15c

Italian Hemp, 40c 15c

Lines, 57c 15c

Wire, Picture—

Braided or Twisted, 30c 10c 30c 10c

Corn Knives and Outters

—See Knives, Corn.

**Corn Planters—**

See Planters, Corn—

**Crackers, Nut—**

Little Giant, \$7.00

Cradles—

Grain 50c

Crayons—

White Round Crayons, gross, 15c 55c

Cases, 100 gro., \$4.50 \$5.00, at factory.

D. M. Stewart Mfg. Co.:

Metal Workers' Crayons, gr. \$2.50

Soapstone Pencils, round, flat or square, each \$1.50

Rolling Mill Crayons, gr. \$2.50

Railroad Crayons (composition), each \$2.00

See also Chalk.

Creamery Pails—See Pails, Creamery.

**Crooks, Shepherds'—**

Fort Madison, Heavy, \$7.00

Fort Madison, Light, \$6.50

Crow Bars—See Bars, Crow.

**Cultivators—**

Victor Garden, \$10.00

Cutters—

Glass—

Smith &amp; Reminway Co. 80c

**Meat—**

American:

Nos. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

Each, \$5 \$7 \$10 \$25 \$50 \$60

Connecticut:

Nos. 0 1 8 10 13

Each, \$1.75 2.25 3.00 3.00 5.50

**Enterprise—**

Nos. 5 10 12 22 32

Each, \$2 \$3 \$2.50 \$4 \$6

**Glimests—**  
Nail, Metal, Assorted, gro. \$1.40@1.75  
Spike, Metal, Assorted, gro. \$3.00@3.50  
Nail, Wood Handled, Assorted, gro. \$4.00@4.25  
Spike, Wood Handled, Assorted, gro. \$5.00@5.25

### Glass, American Window

Small lots from store:  
Single, Eastern.....85%  
Second and Third Brackets.....85%  
Eastern, All Other Brackets.....85%  
Double, Eastern.....85%

First Bracket.....85%  
Second, Third, Fourth and Fifth Brackets.....85%  
All Other Brackets.....85%  
From Jobbers or Factory, with Freight Allowance, except in Eastern district:

Carloads, Single Strength.....85%  
First Bracket.....85%  
Second and Third Brackets.....85%  
All Above.....85%  
Carloads, Double Strength.....85%  
First Five Brackets.....85%  
60 inch Bracket.....85%  
70 to 100 inch Bracket, inclusive.....85%  
All Above.....85%

Glue—Liquid, Fish—  
List A, Bottles or Cans, with Brush.....85%  
List B, Cans (½ pts., pts., qts.).....85%  
List C, Cans (½ gal., gal.).....85%

Glue Pots—See Pots, Glue.  
Grease, Axle—  
Common Grade.....\$5.00@6.00  
Dixon's Everlasting.....10-12 pails, ea. \$5.00  
Dixon's Everlasting, in bxs., ½ doz. 1 b.....\$1.20; 2 b \$2.00

Snow Flake:  
1 qt. cans, per doz. \$2.00; 2 qt. \$3.00;  
1 gal. cans per doz. \$4.00; 2 gal. \$6.00;  
16.00; 2 gal. \$24.00

Grindstone Fixtures—  
See Fixtures, Grindstone.

Guards, Snow—  
Cleveland Wire Sp. Inc. Co.:  
Galv. Steel 1000.....\$9.00  
Copper 1000.....\$13.00

Gun Powder—See Powder.

Hack Saws—See Saws.

Hats, Awl—  
Peg Patent, Leather Top.....\$4.50@5.25  
Peg Patent, Plain Top.....\$3.50@3.75  
Sewing, Brass Ferrule.....\$1.50@1.60  
Saddlers', Brass Ferrule.....\$1.25@1.45  
Peg, Common.....\$1.25@1.35  
Brad, Common.....\$1.50@1.75

Halters and Ties—  
Covert Mfg. Co., Web.....45¢  
Covert Mfg. Co., Jute Rope.....45¢  
Covert Mfg. Co., Sisal Rope.....80¢  
Covert's Saddlery Works, 96 list, W. B. 100.....60¢  
Covert's Saddlery Works, Leather 60¢  
Covert's Saddlery Works, Jute.....60¢  
Covert's Saddlery Works, Sisal.....60¢  
Covert's Saddlery Works, Manila.....60¢  
Covert's Saddlery Works, Cotton.....70¢

Hammers—  
Handled Hammers—  
Heller's Machinists.....50¢  
Heller's Machinists.....50¢  
Magnetic Tack, Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.....1.75  
Peck, Stow & Wilcox.....40¢  
Fayette H. Plumb.....39¢  
Engineers' and B. S. Hand.....60¢  
Machinists' Hammers.....60¢  
Riveting and Tanners.....50¢  
Sargent's C. S. New List.....45¢

Heavy Hammers and Sledges—  
3 lb. and under.....lb. 50¢  
5 to 10 lb.....lb. 80¢  
Over 10 lb.....lb. 1.00  
Wilkinson's Smiths.....94¢@1.00 lb.

Handcuffs and Leg Irons  
Set Police Goods.

Handles—  
Agricultural Tool Handles—  
Hoe Rake, Fork, etc.....60¢@60¢  
Shovel, etc., Wood D Handle.....50¢  
Cross-Cut Saw Handles—  
Atkins.....40¢  
Champion.....45¢  
Dixson.....50¢

Mechanics' Tool Handles—  
Auger, assorted.....gro. \$1.40@1.75  
Auger, large.....gro. \$2.50@3.00  
Brad Auger.....gro. \$1.50@1.75  
Chisel Handles:  
Apple Tanged Firmer, gro. ass'd.....\$2.50@2.75; large, \$3.50@3.75  
Hickory Tanged Firmer, gro. ass'd.....\$1.75@1.95; large, \$2.50@2.75  
Apple Socket Firmer, gro. ass'd.....\$1.75@1.95; large, \$2.50@2.75  
Hickory Socket Firmer, gro. ass'd.....\$1.60@1.75; large, \$2.50@2.75  
Hickory Socket Framing, gro. ass'd.....\$2.50@2.75; large, \$3.50@3.75  
File, assorted.....gro. \$1.00@1.15  
Hammer, Hatchet, Axe, etc.....\$1.00  
Hand Saw, Varied, doz. 75¢  
Not Varied.....55¢  
Plane Handles:  
Jack, doz. 25¢; Jack Bolted.....55¢  
Fore, doz. 55¢; Fore, Bolted.....70¢

### Hangers—

Barn Door, New Pattern, Round Groove, Regular:  
Inch.....3 4 5 6 8  
Doz.....\$1.10 1.45 1.80 2.10 2.75

Barn Door, New England Pattern, Check Back, Round Groove, Regular:  
Inch.....3 4 5 6 8  
Doz.....\$1.50 2.00 2.50 3.00 3.25

Chicago Spring Butt Co.:  
Friction.....25¢  
Oscillating.....25¢  
F-T Twin.....25¢  
Chisholm & Moore Mfg. Co.:  
Baggage Car Door.....50¢  
Elevator.....40¢  
Railroad.....55¢  
Czar Ball Bearing, ½ doz. pair \$7.50  
No. 10 Roller Bearing, doz. pr. 5.50  
No. 20 Roller Bearing, doz. pr. 4.50  
Nickel.....50¢  
J. G. C.....50¢  
Crown's Hanger Co.:  
1 doz. axle.....60¢  
Roller Bearing.....60¢  
Lane Bros.:  
Parlor, Standard.....\$3.25  
Parlor, New Model.....\$3.75  
Barn Door, Standard.....60¢  
Covered.....50¢  
Special.....60¢  
Lawrence Bros.:  
Advance.....60¢  
Cleveland.....60¢  
Crown.....60¢  
New York.....60¢  
Sterling.....60¢  
McKinney Mfg. Co.:  
No. 2, Standard, 18.....60¢  
No. 1, Special, 18.....60¢  
Stowell Mfg. and Foundry Co.:  
Baggage Car Door.....60¢  
Olimax Anti-Friction.....50¢  
Elevator.....40¢  
Interstate.....50¢  
Magic.....50¢  
Matchless.....50¢  
Parlor Door.....50¢  
Railroad.....50¢  
Street Car Door.....50¢  
Steel, Nos. 300, 400, 500.....40¢  
Wild West.....50¢  
Zenith Wood Track.....50¢  
Taylor & Boggis Foundry Co.:  
Kidder's.....50¢  
Van Wagoner & Williams Hdw. Co.:  
American Trackless.....33¢  
Wilcox Mfg. Co.:  
Bike Roller Bearing.....60¢  
C. J. Roller Bearing.....60¢  
Cycle Ball Bearing.....50¢  
Dwarf Ball Bearing.....40¢  
Ives, Wood Track.....60¢  
L.T. Roller Bearing.....60¢  
New Era Roller Bearing.....50¢  
O. K. Roller Bearing.....60¢  
Richards' Wood Track.....50¢  
Richards' Steel Track.....50¢  
Richards' Roller Bearing.....60¢  
Richards' Steel Track.....50¢  
Richards' Roller Bearing.....60¢  
Tandem Nos. 1 and 2.....60¢  
Underwriters' Roller Bearing.....40¢  
Wilcox Auditorium Ball Bearing.....50¢  
Wilcox Barn Trolley No. 123.....40¢  
Wilcox Fire Trolley, Roller Bearing.....40¢  
Wilcox Le Roy Noiseless Ball Bearing.....40¢  
Wilcox New Century.....50¢  
Wilcox Trolley Ball Bearing.....40¢

Harness Menders—  
See Menders.

Harness Snaps—See Snaps.

Hasps—  
McKinney's Perfect Hasp ½ doz. 10¢  
Wrought Hasps, Staples, &c.—See Wrought Goods.

Hatchets—  
Best Brands.....10¢@10¢  
Cheaper Brands.....60¢@60¢  
Note.—Not prices often made.

Hay and Straw Knives—  
See Knives.

Hinges—  
Blind and Shutter Hinges—  
Acme and Dixie Shutter:  
Doz. pair.....\$0.65 60 55 47  
Buffalo and Queen City Reversible Shutter:  
No.....1 1½ 2 3 4 5  
Doz. pair.....\$0.65 60 55 47  
Lull & Porter Old Style Shutter:  
No.....1 1½ 2 3 4 5  
Doz. pair.....\$0.65 60 55 47  
1888 Old Pattern Blind Hinge:  
No.....1 1½ 2 3 4 5  
Doz. pair.....\$0.75 1.35 1.55 1.75 1.90  
Parker.....70¢  
North's Automatic Blind Fixtures, No. 2, for Wood, \$9.00; No. 3, for Brick, \$11.50  
Reading's Gravity.....75¢  
Sargent's, Nos. 1, 3, 5.....65¢  
Sargent's, Nos. 11 & 12.....70¢  
Wrightsville Hardware Co.:  
Acme, Lull & Porter.....65¢  
Buffalo Gravity Looking, Nos. 1, 3, 5.....65¢  
Champion Gravity Looking, No. 75, 75¢  
1888 Old Pat'n, Nos. 1, 3 & 5.....75¢  
Tip Pattern, Nos. 1, 3 & 5.....75¢  
Double Locking, Nos. 30 and 25.....70¢  
Empire, Nos. 101 and 103.....65¢  
Niagara Gravity Looking, Nos. 1, 3, 5.....65¢  
Noiseless, Nos. 55, 60, 65 and 55.....65¢  
O. S. Lull & Porter.....65¢  
Pioneer, Nos. 080, 45 and 54.....65¢  
Steamboat Gravity Looking, No. 10.....75¢  
Stanley's Steel Gravity Blind Hinges, ½ doz. sets \$1.20.....20¢  
Gate Hinges—  
Clark's or Shepard's—Doz. sets:  
No.....1 2 3  
Hinges with Latches.....\$1.20 2.50 4.25

Hinges only.....1.30 1.55 3.20  
Latches only.....0.70 0.70 1.20

New England:  
With Latch.....doz. \$1.75@1.80  
Without Latch.....doz. \$1.40@1.45  
Reversible Self-Closing:  
With Latch.....doz. \$1.65@1.75  
Without Latch.....doz. \$1.30@1.35

Western:  
With Latch.....doz. \$1.60@1.65  
Without Latch.....doz. \$1.00@1.05

Spring Hinges—  
Holdback, Cast Iron, gro. \$9.00@10.00  
Non-Holdback, Cast Iron.....gro. \$7.00@7.50

J. Bardley:  
Bardley's Patent Checking.....15¢  
Bommer Bros.:  
Chicago Spring Butt Co.:  
Chicago.....20¢  
Floor Hinge.....40¢  
Garden City Engine House.....20¢  
Keene's Saloon Door.....20¢  
Triple End.....40¢  
Coleman Hdw. Co.:  
Champion Holdback.....\$ gr. \$10.00  
J. G. C.....\$ gr. \$9.50  
Lawson Mfg. Co.:  
March ss.....30¢  
Matchless Pivot.....35¢  
Payson Mfg. Co.:  
Oblique, Dbl. Acting.....50¢  
Stover Mfg. Co.:  
Ideal, No. 16, Detachable, \$ gr. \$12.50  
Ideal, No. 4.....\$ gr. \$9.00  
New Idea No. 1.....\$ gr. \$9.00  
New Idea, Double Acting.....45¢  
Van Wagoner & Williams Hdw. Co.:  
Acme, Vrt. Steel.....30¢  
Acme, Brass.....30¢  
American.....30¢  
Columbia, No. 14.....\$ gr. \$9.00  
Columbia, No. 18.....\$ gr. \$9.00  
Columbia, Adjustable.....30¢  
Gem, new list.....25¢  
Cover Leaf.....\$ gr. \$12.50  
Oxford new list.....25¢

Wrought Iron Hinges—  
Strap and T Hinges, &c., list Mar. 15, 1898:  
Light Strap Hinges.....66¢  
Heavy Strap Hinges.....70¢  
Light T Hinges.....60¢  
Heavy T Hinges.....60¢  
Extra Heavy T Hinges.....66¢  
Hinge Hasps.....45¢  
Cor. Heavy Strap.....70¢  
Cor. Ex. Heavy T.....66¢  
Rolled Plate.....70¢  
Screw Hook, 1½ to 2 in., lb. 3 @ 34¢  
and Strap, 23 to 26 in., lb. 2½ @ 34¢  
Screw Hook and Eye:  
¾ in. 1 in. lb. 5½ @ 54¢  
5½ in. lb. 6½ @ 64¢  
¾ in. lb. 7½ @ 74¢

Hoes—Eye—  
Scovill and Oval Pattern.....50¢  
Grub. list Feb. 23, 1899.....65¢  
D. & H. Scovill.....65¢

Handled—  
Sept. 1, 1900, List:  
Field and Garden.....75¢  
Ladies', Boys', Toy and Onion.....70¢  
Street and Mortar.....75¢  
Cotton.....70¢  
Planters'.....70¢  
Welding.....75¢  
Note.—Manufacturers and Jobbers use a diversity of lists, and often sell at net prices.  
Ft. Madison Crucible Garden Hoe.....75¢  
Ft. Madison Crescent Cultivator Hoe.....75¢  
Ft. Madison Mattock Hoe.....75¢  
Regular Weight.....\$ doz. \$4.50  
Junior Size.....\$ doz. \$4.00  
Ft. Madison Sprouting Hoe.....\$ doz. \$4.80  
Ft. Madison Dixie Tobacco Hoe.....75¢  
Kretschmer's Cut Easy, per doz.....75¢  
W. & C. Ivanhoe.....75¢  
B. Cultivator Hoe.....75¢  
Acme Weeding.....75¢  
W. & C. Lightning Shuffle Hoe.....\$ doz. \$5.50

Hog Rings and Ringers—  
See Rings and Ringers.

Hoisting Apparatus—  
See Machines, Hoisting.

Hollow Ware—  
See Ware, Hollow.

Holders—  
Angular, \$ doz. \$34.00.....45¢  
File and Tool—  
C. E. Jennings & Co. Model Tool Holders.....35¢  
Nicholson File Holders and File Handles.....35¢

Hooks—Cast Iron—  
Bird Cage, Reading.....50¢  
Bird Cage, Sargent's List.....50¢  
Clothes Line, Sargent's List.....50¢  
Ceiling, Sargent's List.....50¢  
Clothes Line, Stowell's.....70¢  
Clothes Line, Reading List.....65¢  
Coat and Hat, Stowell's.....70¢  
Coat and Hat, Reading.....70¢  
Coat and Hat, Sargent's List.....85¢  
Coat and Hat, Wrightsville.....65¢  
Harness, Reading List.....70¢

Wire—  
Belt.....75¢  
Atlas, Coat and Hat.....45¢  
Single Cases.....45¢  
10 Case Lots.....45¢  
Car Harness.....50¢  
Wire Coat and Hat.....50¢  
Acme.....50¢  
V. Brace, Chief and Caesar.....50¢

Gem.....50¢  
Bright Wire Goods—See Wire.

Wrought Iron—  
Box, or Case, Octagon Steel.....doz. \$2.10@2.20  
Cotton.....doz. \$1.05@1.15  
Wrought Staples, Hooks, &c.—See Wrought Goods.

Miscellaneous—  
Bush, Light, doz. \$5.50; Medium, \$6.00; Heavy, \$6.50  
Grass.....Nos. 1 2 3  
Best.....\$1.50 1.75 2.00  
Common.....\$1.40 1.50 1.75  
Potato and Manure.....70¢  
Whistle, &c.....lb. 44¢  
Hooks and Eyes:  
Brass.....60¢  
Malleable Iron.....70¢  
Covert Saddlery Works' Self Locking Gate and Door Hook.....60¢  
Crown Picture.....50¢  
Bench Hooks—See Bench Stops.  
Corn Hooks—See Knives, Corn.

Horse Nails—See Nails, Horse.

Horseshoes—  
See Shoes, Horse.

Hose Rubber—  
Garden Hose, ¾ in.:

Competition.....ft. 44¢  
3-ply Standard.....ft. 5 @ 6 c  
4-ply Standard.....ft. 8 @ 9 c  
3-ply extra.....ft. 9 @ 10 c  
4-ply extra.....ft. 11 @ 13 c  
Cotton Garden, ¾ in., coupled:  
Low Grade.....ft. 5 @ 7 c  
Fair quality.....ft. 8 @ 9 c

Irons—Sad—  
From 4 to 10.....lb. 3 @ 34¢  
B. B. Sad Irons.....lb. 3½ @ 40¢  
Chinese Laundry.....lb. 6 @ 54¢  
Chinese Sad.....lb. 3½ @ 34¢  
Mrs. Potts, per set:  
Nos. 50 55 60 65  
75c 69c 83c 79¢  
New England Pressing, lb. 3½ @ 34¢

Soldering—  
Soldering Coppers.....lb. 21¢  
Covert Mfg. Co.....20¢

Pinking—  
Pinking Irons.....doz. 60¢

Jack Screws—See Screws.

Jacks, Wagon—  
Covert Mfg. Co., Steel.....45¢  
Daisy.....70¢  
Lockport.....40¢  
Victor.....60¢  
Lane's Steel.....40¢

Kettles—  
Brass, Spun, Plain.....20¢  
Enameled and Cast Iron—See Ware, Hollow.

Knife Sharpeners—  
See Sharpeners, Knife.

Knives—  
Butcher, Shoe, &c.—  
Dick's Butcher Knives.....40¢  
Foster Bros' Butcher, &c.....30¢  
Nichols' Butcher Knives.....50¢  
Hay and Straw—See Hay Knives.

Corn—  
Ft. Madison Cut-Easy, ½ doz.....\$3.25  
Withington Acme, ½ doz., \$2.65; Dent, \$2.75; Ad. Serrated, \$2.20; Serrated, \$2.10; Yankee No. 1, \$1.50; Yankee No. 2, \$1.15.

Drawing—  
Standard List.....70¢  
Adjustable Handle.....25¢  
Bradley's.....35¢  
C. E. Jennings & Co. Nos. 45, 46, 40¢  
Jennings & Griffin.....60¢  
Swan's.....70¢  
Watrous.....50¢  
L. & I. J. White.....20¢  
Cantele Folding.....50¢

Hay and Straw—  
Blissard.....\$7.50@8.00  
Iwan's Sickle Edge.....\$ doz. \$1.50  
Lightning.....\$7.50

Mincing—  
Buffalo.....\$ doz. \$15.00  
Smith's, ½ doz., Single, \$2; Double, \$3.....45¢

Miscellaneous—  
Farriers'.....doz. \$2.00@3.00  
Woolenbolts.....\$ doz. \$3.00@3.25

Knobs—  
Base, ¾ in., Birch, Rubber tip, gro.....\$1.25@1.40  
Carriage, Jap. all sizes.....gro. 30¢@35¢  
Door, Mineral.....doz. 68¢@70¢  
Door, Por. Jap d.....doz. 75¢@80¢  
Door, Por. Nickel.....doz. \$2.10@2.20  
Bardley's Wood Door, Shutter, &c.....15¢  
Picture, Sargent's.....60¢  
Snow's Victor.....50¢

Ladders, Step—  
Handy Ladder Work:

Length, Length, Shipped, Shipped, Extended, Ready for K. D., Feet, Feet, Use Per doz. Per doz.  
4.....16.00.....17.00  
5.....19.50.....21.00  
6.....24.50.....25.00  
7.....29.50.....30.00  
8.....34.00.....32.00  
9.....39.00.....35.00  
10.....43.00.....38.00  
11.....45.50.....40.00  
12.....51.00.....45.00

Ladies—Melting—  
L. & S. W.....40¢  
Reading.....60¢  
Sargent's.....40¢

Lanterns—Tubular—  
Regular Tubular.....doz. \$4.50@5.00  
Side Lift Tubular.....doz. \$4.75@5.25  
Square Lift Tubular.....doz. \$4.75@5.25  
Other Styles.....10¢@10¢



**Bull's Eye Police—**  
 3 1/2-inch flash light..... doz. \$3.50 @ \$3.75  
 3-inch flash light..... doz. \$4.00 @ \$4.25  
 2 1/2-inch regular..... doz. \$3.25 @ \$3.50  
 3-inch regular..... doz. \$3.50 @ \$3.75

**Latches, Thumb—**  
 Roggin's Latches..... doz. \$2 @ \$3.00

**Lawn Mowers—**  
 See Mowers, Lawn.

**Leaders, Cattle—**  
 Small..... doz. 45c; large, 55c  
 Covert Mfg. Co..... 45c @ 52c

**Lemon Squeezers—**  
 See Squeezers, Lemon.

**Lifters, Transom—**  
 Dickson:  
 3 x 4 ft. x 1/2"..... \$100 \$11.00  
 Other sizes Iron..... 70c @ 10c  
 Other sizes, Brass and Bronze..... 70c  
 Excelsior..... 60c @ 80c @ 10c  
 Payson's:  
 Solid Grip Nos. 643 and 644, \$1.00

Bronzed Iron..... 70c

**Lines—**  
 Wire Clothes, Nos. 18 19 20  
 100 feet..... \$3.50 \$4.00 \$4.50  
 75 feet..... \$2.15 1.90 1.65

**Ossaw Mills,**  
 Crown Solid Braided Chalk..... 33c @ 35c  
 Mason's, No. 0 to No. 5..... 33c @ 35c  
 Samson Cordage Works:  
 Solid Braided Chalk, No. 0 to 3..... 40c  
 Silver Lake Braided Chalk, No. 0, \$6.00;  
 No. 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50  
 1/2 gr..... 30c

**Locks, &c.— Cabinet—**  
 Cabinet Locks..... 35c @ 37c @ 39c

**Door Locks, Latches, &c.—**  
 [Net prices are very often made on these goods.]

Reading Hardware Co..... 40c  
 R. & E. Mfg. Co..... 50c  
 Sargent & Co..... 40c @ 40c @ 10c  
 Slaymaker-Barry Co..... 30c @ 35c  
 Snow's Victor..... 60c @ 10c

**Elevator—**  
 Etowell's..... 83c @ 85c

**Padlocks—**  
 Wrought Iron, list Dec. 3, '97..... 70c @ 70c @ 10c

**Sash, &c.—**  
 Fitch's Bronze and Brass..... 66c @ 70c  
 Ives' Patent..... 55c @ 55c @ 55c  
 Coffinger's Automatic..... 50c  
 Payson's Perfect..... 70c  
 Payson's Signal (new list)..... 75c  
 Reading..... 60c @ 10c @ 10c @ 70c

**Machines—**  
 Boring—  
 Without Augers.  
 Upright, Angular.  
 Improved No. 3..... \$4.25 No. 1 \$5.00  
 Improved No. 4..... 9.75 No. 2 9.38  
 Improved No. 5..... 2.75  
 Jennings'..... 2.50 3.00  
 Miller's Falls..... 5.75  
 Snell's, Rice's Pat. 2.50 2.75  
 Swan's, No. 500..... 6.10 No. 900 6.45

**Holisting—**  
 Moore's Anti-Friction Differential Pulley Block..... 30c  
 Moore's Hand Hoist, with Lock Brake..... 30c

**Ice Cutting—**  
 Chandler's..... 15c

**Washing—**  
 Wayne American, \$ doz. \$38.00  
 Western Star, No. 2, \$ doz. 30.00  
 Western Star, No. 3, \$ doz. 30.00  
 St. Louis, No. 41, \$ doz. 60.00

**Mallets—**  
 Hickory..... 45c @ 50c @ 55c  
 Lignumvite..... 45c @ 50c @ 55c  
 Timmers', Hickory and Applewood, doz..... 60c @ 55c  
 Fiber Head Stearns'..... 80c @ 10c

**Mats—**  
 Door—  
 Elastic Steel (W. G. Co.)..... 10c

**Mattocks—**  
 See Picks and Mattocks.

**Meat Cutters—**  
 See Cutters, Meat.

**Milk Cans—** See Cans, Milk.

**Mills—** Coffee—  
 Box and Side, list Jan. 1, '93..... 50c @ 10c @ 50c @ 80c @ 55c  
 Net prices are often made on some goods which are lower than above discounts.

Enterprise Mfg. Co..... 25c @ 30c  
 National, list Jan. 1, '94..... 30c  
 Parker's Columbia and Victor..... 50c @ 10c @ 60c  
 Parker's Box and Side..... 50c @ 10c @ 60c  
 Swift, Lane Bros..... 30c

**Mincing Knives—**  
 See Knives, Mincing.

**Molasses Cates—**  
 See Gates, Molasses.

**Money Drawers—**  
 See Drawers, Money.

**Mowers, Lawn—**  
 Net prices are generally quoted.

Good..... all sizes, \$2.50 @ \$2.75

High Grade 1 1/2 1 1/2 1 1/2-inch  
 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80 82 84 86 88 90 92 94 96 98 100  
 Pennsylvania and Continental 60c @ 10c @ 55c  
 Quaker City..... 70c @ 55c  
 Great American..... 70c @ 55c

**Philadelphia:**  
 Styles M., S., C., K., T..... 70c @ 10c  
 Style A, all Steel..... 60c @ 10c  
 Style E, Low Wheel..... 60c @ 10c  
 Style E, High Wheel..... 70c @ 10c  
 Drexel and Gold Coin, low list..... 50c

**Nails—**  
 Cut and Wire. See Trade Report.  
 Wire Nail: and Brads, Papered.  
 List July 10, 1899..... 85c @ 85c @ 10c  
 Hungarian, Finishing, Upholsterers', &c. See Tacks

**Horse—**  
 Nos. 6 7 8 9 10  
 A. C..... 25c 23c 22c 21c 21c 40c @ 55c  
 Capewell..... 19c 18c 17c 16c 16c @ 10c @ 55c  
 C. B. K..... 25c 25c 22c 21c 21c 40c  
 Champlain..... 28c 26c 25c 24c 23c 40c @ 55c  
 Maud S..... 25c 23c 22c 21c 21c 50c  
 Neponset..... 23c 21c 20c 19c 18c 40c  
 Putnam..... 23c 21c 20c 19c 18c 33c @ 45c  
 Standard..... 23c 21c 20c 19c 18c 40c  
 Star..... 23c 21c 20c 19c 18c 35c @ 55c  
 Vulcan..... 23c 21c 20c 19c 18c 25c @ 10c

**Picture**  
 1 1/2 2 2 1/2 3 3 1/2 in.  
 Brass Head..... 45c 60c 70c 95c 1.00 gro.  
 For. Head..... 1.10 1.10 1.10 1.10 gro.

**Nippers, See Pliers and Nippers.**

**Nut Crackers—**  
 See Crackers, Nut.

**Nuts—**  
 List Feb. 1, '99.  
 Cold Punched Off  
 Mfrs. or U. S. Standard. List.  
 Hexagon, plain..... 40c @ 50c  
 Square, plain..... 30c @ 40c  
 Square, C. T. & R..... 40c @ 50c  
 Hexagon, C. T. & R..... 40c @ 50c

**Hot Pressed:**  
 Mfrs. U. S. or Nar. Gauge Stand.  
 Square..... 50c @ 50c @ 30c  
 Hexagon..... 50c @ 50c @ 60c

**NOTE—**Tapped Nuts are now 2-10c higher than above.

**Oakum—**  
 Best or Government..... lb. 6 1/4c  
 Navy..... lb. 5 c  
 U. S. Navy..... lb. 5 1/4c  
 Plumbers' Spun Navy..... 3 c  
 In carload lots 1/4c lb. off f.o.b. New York.

**Oil, Axle—**  
 Snow Flake:  
 1 qt. cans, per doz..... \$3.00  
 1 qt. cans, per doz..... \$4.80  
 1 gal. cans, per doz..... \$15.00  
 5 gal. cans, per doz..... \$60.00 33c @ 10c

**Oil Tanks—** See Tanks, Oil.

**Oilers—**  
 Brass and Copper..... 40c @ 10c @ 50c  
 Tin or Steel..... 60c @ 10c @ 55c  
 Zinc..... 60c @ 10c @ 65c

**Malleable, Hammers' Improved, No. 1**  
 \$3.50; No. 2, \$4; No. 3, \$4.40; No. 4, \$5  
 Malleable, Hammers' Old Pattern, same list..... 50c @ 10c  
 Wilcox & Hobbs Mfg. Co.:  
 Spring Bottom Cans..... 70c @ 70c @ 10c  
 Railroad Oilers etc..... 60c @ 60c @ 10c

**Openers—**  
**Can—**  
 French..... doz. 25c  
 Iron Handle..... doz. 25c @ 37c  
 Sprague, Iron Hdl. per doz \$5 @ 40c  
 Sardine Scissors..... doz. \$1.75 @ \$3.00  
 Tip Top..... per doz. \$0.75  
 National, \$ gro..... \$1.75 @ \$2.00  
 Stowell's..... per doz. 40c @ 45c  
 Waldorf, \$ gro..... \$9.00

**Egg—**  
 Nickel Plate..... per doz. \$2.00  
 Silver Plate..... per doz. \$4.00

**Packing—**  
**Rubber—**  
 Standard, fair quality..... 70c @ 10c @ 75c  
 Inferior quality..... 75c @ 10c @ 80c  
 Extra..... 60c @ 50c @ 10c @ 55c  
 Jenkins' Standard, \$ 80c..... 25c @ 25c @ 55c

**Miscellaneous—**  
 American Packing..... 9c @ 10c lb.  
 Cotton Packing..... 13c @ 11c lb.  
 Italian Packing..... 10c @ 11c lb.  
 Jute..... 5c @ 5 1/2c lb.  
 Russia Packing..... 12c @ 13c lb.

**Pails—**  
**Creamery—**  
 S. S. & Co., with gauges. No. 1 \$8.50;  
 No. 2, \$8.75 \$ doz.

**Galvanized—**  
 Price per gro.  
 Inch..... 10 11 12  
 Water, Regular..... 18 20 21 20 21 20  
 Water, Heavy..... 22 20 21 20 21 20  
 Fire, Rd. Bottom..... 31 30 31 30 31 30  
 Well..... 27 29 30 31 30 31

**Pans—**  
**Dripping—**  
 Standard List..... 60c @ 60c @ 55c

**Fry—**  
 Standard List..... 75c @ 10c @ 80c

**Roasting and Baking—**  
 Regal, S. S. & Co., \$ doz. Nos. 3, \$4.50;  
 No. 5, \$5.00; No. 20 \$3.50; No. 30 \$3.00  
 Simplex, \$ gro. No. 40, \$33.00; No. 50, \$34.50; No. 60 \$39.00; No. 140, \$33.00; No. 150, \$37.50; No. 160, \$43.00.

## Paper—

**Building Paper—**  
 Per roll  
 Rosin Sized Sheathing: 500 sq. ft.  
 Light wt., 20 sq. ft. to lb. \$0.40 @ 0.45  
 Medium wt., 18 sq. ft. to lb. \$0.80 @ 0.85  
 Heavy wt., extra quality, \$0.95 @ 1.05  
 Medium Grades Water Proof  
 Sheathing..... \$0.80 @ 1.25  
 Deafening Felt, 9, 6 and 1 1/2 sq. ft.  
 to lb., ton..... \$3.00 @ 45.00  
 York Haven Waterproof Sheathing..... \$1.35 @ 1.75

**Tarred Paper.**  
 1 ply (roll 300 sq. ft.), ton..... \$30.00  
 2 ply, roll 100 sq. ft..... 85c  
 3 ply, roll 100 sq. ft..... 85c @ 90c

**Sand and Emery—**  
 List Dec. 23, 1899..... 50c @ 10c @ 50c @ 10c @ 55c  
 See Trade Report.

**Parers—**  
**Apple—**  
 Advance..... \$ doz. \$4.50  
 Baldwin..... \$ doz. \$5.00  
 Bonanza..... each \$5.00  
 Dandy..... each \$7.50  
 Eureka, 1898..... each \$16.00  
 Family Bay State..... \$ doz. \$12.00  
 Hudson's Little Star..... \$ doz. \$4.00  
 Hudson's Rocking Table..... \$ doz. \$5.50  
 Improved Bay State \$ doz. \$37.00 @ 30.00  
 New Lightning..... \$ doz. \$5.50  
 Reading 72..... \$ doz. \$4.00  
 Reading 78..... \$ doz. \$7.00  
 Turn Table '98..... \$ doz. \$5.50  
 White Mountain..... \$ doz. \$4.00

**Potato—**  
 Saratoga..... \$ doz. \$5.50  
 White Mountain..... \$ doz. \$4.50

**Picks and Mattocks—**  
 List Feb. 23, 1899..... 65c @ 65c @ 10c

**Pinking Irons—**  
 See Irons, Pinking.

**Pins—**  
**Escutcheon—**  
 Brass..... 60c @ 10c  
 Iron, list Nov. 11, '85..... 60c @ 10c

**Pipe, Cast Iron Soil—**  
 Factory Shipments.  
 Standard, 2-6 in..... 65c @ 10c  
 Extra Heavy, 2-6 in..... 70c  
 Fittings..... 75c

**Pipe, Merchant, Boiler**  
**Tubes, &c.—**  
 Carloads to Consumers.  
 Merchant Pipe.  
 Black. Galva-  
 nized.  
 1/2 to 3/4 inch..... 61c 45c  
 3/4 to 10 inch..... 68c 50c

**Boiler Tubes.**  
 Up to 22 feet and over.  
 Steel. 22 feet and over.  
 1 to 1 1/2 inch and 1/4 in. 55c 50c  
 1 1/2 to 2 1/4 inch..... 61c 46c  
 2 1/4 to 13 inch..... 65c 55c

**Iron.**  
 1 to 1 1/2 inch and 1/4 in. 55c 49c  
 1 1/2 to 2 1/4 inch..... 61c 46c  
 2 1/4 to 13 inch..... 65c 55c

**Casing. S. & S.**  
 2 to 3 inch..... 60c  
 3 1/4 to 4 inch..... 65c  
 4 1/2 to 18 1/2 inch..... 61c 1/2  
 NOTE—The old list is still used by some jobbers, and net prices are often quoted.

**Planes and Plane Irons—**  
**Wood Planes—**  
 Molding..... 10c @ 10c @ 10c @ 55c  
 Bench, First quality..... 15c @ 10c @ 10c @ 55c  
 Bench, Second quality..... 15c @ 10c @ 10c @ 55c

**Bailley's (Stanley R. & L. Co.)**  
 50c @ 10c @ 50c @ 10c @ 55c  
 Gage Self Setting..... 35c

**Iron Planes—**  
 Bailley's (Stanley R. & L. Co.)..... 50c @ 10c @ 50c @ 10c @ 55c  
 Chaplin's Iron Planes..... 50c @ 10c @ 50c @ 10c @ 55c  
 Miscellaneous Planes (Stanley R. & L. Co.)..... 35c @ 10c @ 35c @ 10c @ 55c  
 Sargent's..... 50c @ 10c @ 50c @ 10c @ 55c

**Plane Irons—**  
 Wood Bench Plane Irons..... 35c @ 35c @ 55c  
 Buck Bros..... 30c  
 Butcher's..... \$5.00 @ 5.25 @ 2  
 Stanley R. & L. Co. 50c @ 10c @ 50c @ 10c @ 55c  
 L. & L. J. White..... 20c @ 25c

**Planters, Corn, Hand.**  
 Kohler's Eclipse..... \$ doz. \$9.00

**Plates—**  
 Felloe..... lb. 3/4 @ 40  
 Self-Sealing Pie Plates (S. S. & Co.), \$ doz. \$2.00..... 50c

**Pliers and Nippers—**  
 Button Pliers..... 65c @ 10c @ 70c @ 10c  
 Gas Burner, per doz., 5 in., \$1.15 @ \$1.20; 6 in., \$1.35 @ \$1.45.  
 Gas Pipe..... 7 8 10 12-in.  
 \$1.75 \$2.00 \$2.75 \$3.75

**Same Nippers..... 40c @ 40c @ 55c**  
 Bernard's:  
 Parallel Pliers, &c..... 33c @ 50c  
 Paragon Pliers..... 50c  
 Lodi Pliers..... 50c  
 Kim City Fence Pliers..... 33c @ 50c  
 Cron's Hanger Co.:  
 "Iron's"..... 60c  
 Improved Button..... 70c @ 50c  
 Stub's..... 50c  
 Combination and others..... 25c  
 Haller's Farriers' Nippers, Pincers, and Tools 50c @ 50c @ 55c  
 Morrill's Parallel, \$ doz. \$12.00..... 30c @ 55c  
 P. S. & W. Cast Steel..... 30c @ 10c @ 40c  
 P. S. & W. Timmers' Outting Nippers..... 40c @ 40c @ 55c  
 Swedish Slide, End and Diagonal Cutting Pliers..... 50c  
 Utica Drop Forge & Tool Co.:  
 Pliers and Nippers, all kinds..... 40c

**Plumbs and Levels—**  
 70c @ 10c @ 70c @ 10c @ 10c  
 Davis Iron, Machinist N. S. 1 to 14..... 30c  
 Davis Iron, Adjustable Nos. 6 to 40..... 35c  
 Diston's..... 70c  
 Pocket Levels..... 75c @ 10c @ 75c @ 10c  
 Stanley R. & L. Co..... 25c @ 10c @ 25c @ 10c @ 10c  
 Stanley's Duplex..... 25c @ 10c @ 25c @ 10c @ 10c  
 Woods' Extension..... 33c @ 55c

**Poachers, Egg—**  
 Buffalo Steam Egg Poachers, \$ doz. No. 1, \$7.50; No. 2, \$11.00 No. 3, \$11.00; No. 4, \$14.50..... 50c

**Points, Glaziers'—**  
 Bulk and 1 lb. papers..... lb. 11 1/4 @ 13 c  
 1/2 lb. papers..... lb. 13 @ 13 1/2 c  
 1/4 lb. papers..... lb. 13 1/2 @ 13 c

**Pokes, Animal—**  
 Ft. Madison, Western..... \$ doz. \$3.25  
 Ft. Madison, Western..... \$ doz. \$3.75

**Police Goods—**  
 Manufacturers' Lists..... 25c @ 25c @ 25c  
 Towers..... 25c

**Polish—Metal—**  
 Prestoline Liquid, No. 1 (1/4 pt.), \$ doz. \$3.00; No. 2 (1 qt.), \$9.75..... 40c  
 Prestoline Paste..... 33c @ 40c  
 U. S. Metal Polish Paste, 3 oz. boxes, \$ doz. 50c; \$ gr. \$4.50; 1/2 lb. boxes, \$ doz. \$1.25; 1 lb. boxes, \$ doz. \$2.25  
 U. S. Liquid, 3 oz. cans, \$ doz. \$1.25; \$ gr. \$12.00  
 Barkeepers' Friend Metal Polish, \$ doz. \$1.75; \$ gr. \$18.00  
 Wynn's White Silk, 1/2 pt. cans, \$ doz. \$1.50

**Stove—**  
 Black Eagle Benzine Paste, 5 lb. cans..... \$ 10c  
 Black Eagle, Liquid, 1/4 pt. cans..... \$ 10c

**Black Jack Paste, 1/2 lb. cans, \$ doz. 75c**  
 Ladd's Black Beauty, \$ gr. \$10.00..... 50c  
 Joseph Dixon's, \$ gr. \$5.75..... 10c  
 Dixon's Plumbago..... \$ 8c  
 Fireside..... \$ gr. \$2.50  
 Gem, \$ gr. \$4.50..... 10c  
 Japanese..... \$ gr. \$3.50  
 Jet Black..... \$ gr. \$3.50  
 Peerless Iron Enamel, 1/2 pt. cans..... \$ doz. \$1.50  
 Wynn's Black Silk, 5 lb. pail..... each 70c  
 Wynn's Black Silk, 1/2 lb. box, \$ doz. \$1.00  
 Wynn's Black Silk, 5 oz. box, \$ doz. \$0.75  
 Wynn's Black Silk, 1/2 pt. liq., \$ doz. \$1.00

**Poppers, Corn—**  
 Round or Square:  
 1 qt..... gro. \$7.00 @ \$8.00  
 1 1/2 qt..... gro. 9.50 @ 10.50  
 2 qt..... gro. 10.50 @ 11.50

**Post Hole and Tree Augers and Diggers—**  
 See also Diggers, Post Hole, &c.

**Potato Parers—**  
 See Parers, Potato.

**Pots—**  
**Glue—**  
 Enameled..... 60c @ 10c @ 50c  
 Tinned..... 60c @ 10c @ 50c

**Powder—**  
 In Canisters:  
 Duck, 1 lb. each..... 65c  
 Fine Sporting, 1 lb. each..... 75c  
 Rifle, 1/2 lb. each..... 16c  
 Rifle, 1 lb. each..... 25c

**In Kegs:**  
 Duck, 6 1/2 lb. kegs..... \$2.25  
 Duck, 15 1/2 lb. kegs..... \$4.25  
 Duck, 25 lb. kegs..... \$5.00  
 Rifle, 6 1/2 lb. kegs..... \$1.25  
 Rifle, 15 1/2 lb. kegs..... \$2.25  
 Rifle, 25 lb. kegs..... \$4.00

**King's Smokeless Shot Gun and Rifle:**  
 Keg (25 lb. bulk)..... \$32.00  
 Half Keg (12 1/2 lb. bulk)..... \$11.25  
 Quarter Keg (6 1/4 lb. bulk)..... \$5.75  
 Canister (1 lb. bulk)..... \$1.00  
 King's Semi-Smokeless:  
 Keg (25 lb. bulk)..... \$10.00  
 Half Keg (12 1/2 lb. bulk)..... \$5.25  
 Quarter Keg (6 1/4 lb. bulk)..... \$2.75  
 One Pound Can, bulk..... \$0.50

**Presses—**  
**Fruit and Jelly—**  
 Enterprise Mfg. Co..... 30c @ 25c

**Pruning Hooks and Shears—** See Shears.

**Pullers, Nail—**  
 Crown, \$ doz. \$18.00..... 50c  
 Crown Prunes, \$ doz. \$15.00..... 50c  
 cyclops..... 40c @ 10c @ 10c  
 Diamond B, No. 2, doz. \$32; No. 3, \$11..... 40c  
 Eureka, 3 lb. doz. \$18.00; 3 lb. \$15.40; 40c  
 Grant, No. 1, \$ doz. \$16.00; No. 2, \$16.50; No. 3, \$16..... 40c  
 Miller's Falls, No. 3, per doz. \$12.00..... 15c @ 10c

**Pellecan, \$ doz. \$9.00..... 4c @ 10c**  
 Soranton, No. 1 and 2, \$ doz. \$9.00  
 Soranton, No. 3, \$ doz. \$8.50

**Pulleys**

Hay Fork, Swivel or Solid Eye.....  
doz. \$1.50 @ 1.75  
Hay Fork, Stowell's Anti-Friction, 5-in.  
Wheel, doz. \$12.00..... 40¢  
Hot House, Awning, &c..... 40¢  
Japanned Clothes Line..... 60¢ @ 80¢  
Japanned Screw..... 70¢ @ 10¢  
Japanned Slide..... 70¢ @ 10¢  
Stowell's Collingor End, Anti-Friction 60¢  
Stowell's Dumb Waiter, Anti-Friction.....  
60¢ @ 10¢  
Stowell's Electric Light.....  
Stowell's Slide, Anti-Friction..... 60¢ @ 10¢

**Sash Pulleys**

Acme..... 1 1/2 in., 16¢; 2 in., 19¢  
Common Sense, 1 1/2 in., doz., 18¢;  
2 in., 20¢  
Empire..... 1 1/2 in., 15¢; 2 in., 18¢  
Fox-All-Steel, Nos. 3 and 7, 2 1/2 in., doz., 25¢

No. 9, 1 1/2 in., doz. 20¢  
Extra for Plated Finish..... doz. 20¢  
Extra for Anti-Friction Bronze Bushing..... doz. 10¢  
Grand Rapids All Steel Noiseless..... 25¢  
Ideal No. 13..... 30¢  
Improved..... 1 1/2 in., 15¢; 2 in., 18¢  
Niagara..... 1 1/2 in., 16¢; 2 in., 19¢  
No. 20, Troy..... 1 1/2 in., 14¢; 2 in., 16¢  
Star..... 1 1/2 in., 16¢; 2 in., 19¢  
Tackle Blocks—See Blocks.

**Pumps**

Cistern..... 60¢ @ 60¢  
Pitcher Spout..... 75¢ @ 5¢  
Pump Leathers, all sizes..... gro. \$5.00  
Barnes Dbl Acting (low lift)..... 5¢  
Flint & Walling's Fast Mail..... 55¢ @ 55¢  
Flint & Walling's Pitcher Spout..... 75¢  
Loud's Suction Pumps, U. S. Co..... 20¢  
Meyer's Pumps, low lift..... 20¢  
Contractors' Rubber Diaphragm Non-chokable, B. & L. Block Co..... 20¢

**Punches**

Revolving (4 tubes)..... doz. \$4.00 @ 4.50  
Saddlers or Drive good..... doz. 65¢ @ 70¢  
Spring, good quality..... \$3.00 @ 2.25  
Bemis & Call Co.'s Cast Steel Driv..... 50¢  
Bemis & Call Co.'s Che'k..... 55¢  
Bemis & Call Co.'s Spring..... 50¢  
Niagara Hollow Punches..... 45¢  
Niagara Solid Punches..... 55¢  
Steel Screw, R. & K. Mfg. Co..... 40¢  
Tinnars' Hollow, P. S. & W. Co..... 35¢ @ 30¢  
Tinnars' Solid, P. S. & W. Co., doz., 44¢..... 55¢

**Rail**

Barn Door, &c.....  
Barn Door, Light..... 1/2 in. 3/4 3/4  
100 feet..... \$2.00 \$2.50 \$3.00  
B. D., for N. E. Hangers.....  
Small. Med. Large.  
100 feet..... \$2.20 2.70 3.20  
Sliding Door, Bronzed Wrt Iron, ft. 64¢  
Sliding Door, Iron Painted..... 2 1/2 @ 3¢  
Sliding Door, Wrought Brass, 1 1/2 in., lb. 36¢. 30¢  
Cronk's Double Braced Steel Rail, foot..... 34¢  
Cronk's O. N. F. 1 1/2 in. 3/4 3/4  
Lanes' O. N. F. 1 1/2 in. 3/4 3/4  
Lanes' Standard, 100 ft..... 3.75  
Lawrence Bros'..... ft. 4 1/2¢  
McKinney's None Better..... ft. 3¢  
McKinney's Standard..... ft. 3 1/2¢  
Moore's Wrt. Bracket, Steel..... 3 1/2¢  
Stowell's Steel Rail, plain..... 10¢

**Rakes**

Sept. 1, 1900, List:  
Cast Steel..... 70¢ @ 5¢  
Malleable..... 70¢ @ 10¢  
Lawn Rakes, Metal Head, per doz., 10 teeth, \$3.25; 24 teeth, \$5.00  
Fort Madison Red Head Lawn..... \$3.25  
Fort Madison Blue Head Lawn..... \$3.00  
Jackson L. Wn, 24 and 30 teeth..... doz. \$4.50  
Kohler's Lawn Queen, 24-tooth, 1/2 in. 3/4 3/4  
Kohler's Paragon, 24-tooth, 1/2 in. 3/4 3/4  
Kohler's Steel Garden, 14-tooth, 1/2 in. 3/4 3/4  
Kohler's Malleable Garden, 14-tooth, 1/2 in. 3/4 3/4  
doz..... \$2.50

**Rasps, Horse**

Diston's..... 75¢  
Heller Bros..... 60¢ @ 10¢  
McCaffrey File Co. Horse Rasps..... 60¢ @ 10¢  
New Nicholson Horse Rasp..... 70¢ @ 10¢  
See also Files.

**Razors**

Fox Razors, No. 42..... doz. \$30.00  
Fox Razors, No. 44..... doz. \$30.00  
Fox Razors, No. 82, Platina, doz..... \$24.00

Sterling Razor Works..... 50¢  
Razor Straps—  
See Straps, Razor.

**Reels—Fishing—**  
Hendryx Aluminum, German Silver, Gold, Bronze, Silver, Rubber, Popolo and Salmon, Single Action, Multiplying and Quadruple, all sizes..... 30¢  
Hendryx Single Action Series, 103P and PN, 904P and PN, 102P and PN, 202P and PN, 804P and PN, 0304P and PN, 502P and PN, 802P and PN, 02084N, Competitor, 505P and PN, 3004N and PN, 4N and PN, 3004N, 3004P and PN, 002904PN, 0924 and 0924N, 502N and PN..... 40¢ @ 10¢  
Shakespeare, Style C..... 25¢

**Registers**

Black Jap..... 50¢ @ 50¢  
White Jap..... 40¢  
Bronzed..... 40¢  
Nickel Plated..... 40¢  
Electro Plated..... 40¢

**Riddles, Grain or Sand**  
16 in. per doz..... \$2.00 @ 2.25  
17 in. per doz..... \$2.25 @ 2.50  
18 in. per doz..... \$2.50 @ 2.75

**Rings and Ringers—**  
Bull Rings—  
Steel..... \$0.75 0.83 0.88 doz.  
Copper..... 1.10 1.20 1.30 doz.  
Hog Rings and Ringers—  
Hill's Rings..... gro. boxes, \$4.50 @ 5.00

Hill's Ringers, G. I..... doz. 75¢  
Blair's Rings..... gr. \$5.75 @ 6.00  
Blair's Ringers..... doz. \$0.90 @ 1.00  
Brown's Rings..... gr. \$0.90 @ 1.25  
Brown's Ringers..... doz. \$1.00 @ 1.10  
Perfect Rings..... gr. \$0.90 @ 1.25  
Perfect Ringers..... doz. \$1.25 @ 1.35  
Rapid Rings..... gr. \$0.90 @ 1.25  
Rapid Ringers..... doz. \$3.50

**Rivets and Burrs—**  
Copper..... 60¢ @ 50¢  
Iron or Steel..... 6 1/2¢ @ 12 1/2¢  
Miscellaneous..... 6 1/2¢ @ 12 1/2¢

**Rivet Sets—See Sets.**  
**Roasting and Baking**  
Pans—See Pans, Roasting and Baking.

**Rollers**  
Acme Stowell's Anti-Friction..... 50¢  
Barn Door, Sargent's list..... 50¢ @ 10¢  
Cronk's stay..... 60¢  
Cronk's Brinkerhoff..... 60¢  
Lane's Stay..... 33¢  
Stowell's Barn Door Stay..... doz. \$1.25

**Rope**  
NOTE.—Carload lots, except on Jute Rope 4 to 1/2 in. per lb. less than the following prices, which are for small lots.

Manila, 7-16 in. and larger..... lb. @ 10 c  
Manila..... 3/4-inch lb. @ 10 c  
Manila, 1/4 and 5-16 in. lb. @ 11 c  
Manila, Tarred Rope, 15 thread..... lb. @ 10 c  
Manila Hay Rope Med'm lb. @ 10 c  
Sisal, 7-16 in. and larger lb. @ 6 1/2 c  
Sisal..... 1/4-inch lb. @ 7 c  
Sisal, 1/4 and 5-16 in. lb. @ 7 1/2 c  
Sisal, Hay Rope, 3 to 10 ply..... lb. @ 6 1/2 c  
Sisal, Tarred, Medium Lath Yarn..... lb. @ 6 c  
Cotton Rope..... lb. @ 6 c

Best, 1/4-in. and larger lb. @ 11 c  
Med'm, 1/4-in. and larger lb. @ 11 1/2 c  
Com., 1/4-in. and larger lb. @ 8 1/2 c

Jute Rope, No. 1, 1/4 in. and up..... lb. 6 1/2 @ 7 c  
Jute Rope No. 2, 1/4 in. and up..... lb. 6 @ 6 1/2 c  
Jute Rope No. 3, 1/4 in. and up..... lb. 5 1/4 @ 6 1/2 c

**Wire Rope**  
Galvanized..... 30¢ @ 2 1/2¢  
Plain..... 35¢ @ 2 1/2¢

**Ropes, Hammock**  
Cover Mfg. Co..... 45¢ @ 2¢  
Covert Saddle Works..... 60¢

**Rules**  
Boxwood, 75¢ @ 10¢ @ 10¢ @ 75¢ @ 10¢ @ 1¢ @ 10¢  
Ivory..... 40¢ @ 10¢ @ 10¢ @ 10¢ @ 10¢ @ 10¢  
Larkin's Steel..... 50¢ @ 10¢  
Larkin's Lumber..... 50¢ @ 10¢  
Stanley P. & L. Co..... 50¢ @ 10¢  
Boxwood..... 75¢ @ 10¢ @ 75¢ @ 10¢ @ 10¢ @ 10¢  
Ivory..... 35¢ @ 10¢ @ 35¢ @ 10¢ @ 10¢ @ 10¢

**Sad Irons—See Irons, Sad.**  
**Sand and Emery Paper and Cloth—**  
See Paper and Cloth.

**Sash Cords—See Cord, Sash.**  
**Sash Locks—See Locks, Sash.**  
**Sash Weights—**  
See Weights, Sash.

**Sausage Stuffers or Fillers—**  
See Stuffers or Fillers, Sausage.

**Saw Frames—**  
See Frames, Saw.

**Saw Sots—See Sots, Saw.**  
**Saw Tools—See Tools, Saw.**

**Saws**  
Atkins' Circular..... 50¢ @ 50¢  
Atkins' Band..... 50¢ @ 10¢  
Atkins' Cross Cuts..... 35¢ @ 5¢  
Atkins' Mulay, Mill and Drag..... 50¢ @ 10¢  
Atkins' One-Man Saw..... 40¢  
Atkins' Wood Saws..... 40¢  
Atkins' Hand, Compass, &c..... 40¢  
Diston's Circular Solid and Inserted Tooth..... 50¢  
Diston's Band 2 to 14 in. wide..... 60¢  
Diston's Band 1/4 to 1 1/4..... 70¢  
Diston's Crosscuts..... 45¢ @ 45¢  
Diston's Narrow Crosscuts..... 50¢ @ 50¢  
Diston's Mulay, Mill and Drag..... 50¢  
Diston's Framed Wood Saws..... 35¢ @ 35¢  
Diston's Wood Saw Blades..... 40¢ @ 10¢  
Diston's Wood Saw Rods..... 35¢  
Diston's Hand Saws, Nos. 12 99, 9 10, 4100, D, 120, 79, 77, 6..... 25¢ @ 25¢  
Diston's Hand Saws, Nos. 7, 07, 10, 3, 1, 0, 0, Co. combination..... 30¢ @ 30¢  
Diston's Compass Keyhole and 25¢ @ 25¢  
Diston's Butcher Saws and 35¢ @ 35¢  
C. E. Jennings & Co.'s..... 35¢ @ 35¢

Bac. Saws..... 25¢  
Butcher Saws..... 25¢  
Compass and Key Hole Saws..... 25¢  
Framed Wood Saws..... 40¢  
Hand Saws..... 25¢  
Peace Circular and Mill..... 50¢  
Peace Cross Cuts, list Jan. 1, '99..... 50¢  
Peace Hand, Panel and Rip..... 30¢  
Richardson's Circular and Mill..... 50¢  
Richardson's X Cuts, list Jan. 1, '99..... 50¢  
Shanda's Circular Saws..... 50¢  
Simonds' Crescent Ground Cross Cut Saws..... 35¢  
Simonds' One-Man Cross Cuts..... 40¢ @ 10¢  
Simonds' Gang Mill, Mulay and Drag Saws..... 45¢ @ 45¢

**Hack Saws—**  
Diston Concave Blades..... 25¢  
Diston Keystone..... 30¢  
Diston Hack Saw Frames..... 30¢

C. E. Jennings & Co.'s:  
Hack Saw Frames, Nos. 175, 180, 330..... 40¢  
Hack Saws, Nos. 175, 180, 330, com..... 40¢

Griffin's Hack Saw..... 45¢  
Griffin's Hack Saw 14-in..... 45¢  
Star Hack Saws and Blades..... 15¢ @ 10¢

**Scroll**  
Barnes' No. 7, \$15..... 25¢  
Barnes' Scroll Saw Blades..... 40¢  
Barnes' Velocipede Power Scroll Saw, without boring attachment, \$18; with boring attachment, \$30..... 20¢  
Lester, sample..... \$10.00..... 15¢ @ 10¢  
Rovers, complete \$4.00..... 15¢ @ 10¢

**Scale Beams—**  
See Beams, Scale.

**Scales**  
Family, Turnbills..... 30¢ @ 50¢  
Hatch, Counter..... 30¢ @ 50¢  
Platform, 1 lb. by 1/4 oz..... doz. \$5.75  
Two Platforms, 3 lb. by 1/4 oz..... doz. \$10.00

Union Platform, Plain..... \$1.75 @ 2.00  
Union Platform, Striped..... \$1.85 @ 2.15  
Chattillon's Eureka..... 25¢  
Chattillon's Favorite..... 40¢  
Chattillon's Grocers' Trip Scales..... 50¢  
Pelouze Scales—Household, Counting, etc..... 50¢  
"The Standard" Portables..... 45¢  
"The Standard" R. R. and Wagon..... 50¢

**Scrapers**  
Box, 1 Handle..... doz. \$2.25 @ 2.75  
Box, 2 Handle..... doz. \$3.75 @ 4.00  
Ship, No. 1, doz. \$3.50; No. 2..... \$2.25 @ 2.40  
Adjustable Box Scraper (R. R. & L. Co.) \$5.00..... 30¢ @ 10¢  
Foot, W. E. Pratt Mfg. Co..... doz. \$1.15 @ \$1.25

**Screens, Window and Frames—**  
Bonanza Window Screens..... 50¢ @ 10¢ @ 2¢  
Fiver Pattern Window Screen..... 50¢ @ 10¢ @ 2¢  
Maine Window Screen Frames 40¢ @ 10¢ @ 5¢  
Phillips' Window Screen Frames..... 60¢  
Porter's Extension Window Screens..... 50¢ @ 10¢

Wahash Spring Adl. Screen..... 30¢  
**Screw Drivers—**  
See Drivers, Screw.

**Screws—**  
**Bench and Hand—**  
Bench, Iron, doz. 1 in., \$3.00 @ 3.25; 1 1/4, \$3.50 @ 3.75; 1 1/2, \$4.00 @ 4.50  
Bench, Wood, Bench, doz. \$3.50 @ 2.75  
Hand, Wood..... 35¢ @ 10¢  
Hand, Grand Rapids..... 35¢  
Hand, R. Hiss Mfg. Co..... 35¢

**Coach, Lag and Hand Rail—**  
Lag, Common Point, list Oct. 1, '99..... 75¢ @ 10¢ @ 5¢  
Coach and Lag, Gimlet Point, list Oct. 1, '99..... 75¢ @ 10¢ @ 5¢  
Hand Rail, list Jan. 1, '81, 60¢ @ 10¢ @ 5¢

**Jack Screws**  
Millers Falls..... 50¢ @ 10¢  
Millers Falls, Roller..... 50¢ @ 10¢  
P. S. & W..... 40¢ @ 40¢ @ 10¢  
Sargent..... 60¢ @ 10¢ @ 10¢

**Machine—**  
List Jan. 1, '99.  
Flat or Round Head, Iron, 50¢ @ 50¢ @ 10¢  
Flat or Round Head, Brass..... 50¢ @ 50¢ @ 10¢

**Set and Cap—**  
Set (Iron or Steel)..... 60¢ @ 60¢ @ 10¢  
Sq. Hd. Cap..... 65¢  
Hex. Hd. Cap..... 60¢

**Wood—**  
List Jan. 1, 1900.  
Flat Head, Iron..... 30¢  
Flat Head, Iron..... 75¢  
Flat Head, Brass..... 77¢  
Round Head, Brass..... 72¢  
Flat Head, Bronze..... 72¢  
Round Head, Bronze..... 70¢  
Drive Screws..... 60¢

**Scroll Saws—See Saws, Scroll.**  
**Scythes**  
Grass Scythes:  
Natural Finish, per doz. \$7.75 @ 8.00  
Pol. Blade..... per doz. \$8.25 @ 8.50  
Painted or Bronzed, per doz. \$8.25 @ 8.50  
We-d and Bush, per doz. \$7.50 @ 7.75  
Note.—The above are about the association prices to small trade, but are freely cut by jobbers.

**Sythe Snaths—**  
See Snaths, Scythe.

**Seeders**  
**Raisin—**  
Enterprise..... 35¢ @ 30¢

**Sets—**  
**Awl and Tool—**  
Brad Awl and Tool Sets:  
Wood Handle, 10 Awls doz. \$2.00 @ 2.25  
Wood Handle, 14 Awls, 6 Tools..... doz. \$2.50 @ 2.60  
Aiken's Sets, Awl and Tools:  
No. 20, per doz. \$10.00..... 50¢ @ 10¢  
No. 1, per doz. \$10.00..... 50¢ @ 10¢  
No. 3, per doz. \$10.00..... 50¢ @ 10¢  
No. 4, per doz. \$10.00..... 50¢ @ 10¢  
No. 5, per doz. \$10.00..... 50¢ @ 10¢  
No. 6, per doz. \$10.00..... 50¢ @ 10¢  
No. 7, per doz. \$10.00..... 50¢ @ 10¢  
No. 8, per doz. \$10.00..... 50¢ @ 10¢  
No. 9, per doz. \$10.00..... 50¢ @ 10¢  
No. 10, per doz. \$10.00..... 50¢ @ 10¢  
No. 11, per doz. \$10.00..... 50¢ @ 10¢  
No. 12, per doz. \$10.00..... 50¢ @ 10¢  
No. 13, per doz. \$10.00..... 50¢ @ 10¢  
No. 14, per doz. \$10.00..... 50¢ @ 10¢  
No. 15, per doz. \$10.00..... 50¢ @ 10¢  
No. 16, per doz. \$10.00..... 50¢ @ 10¢  
No. 17, per doz. \$10.00..... 50¢ @ 10¢  
No. 18, per doz. \$10.00..... 50¢ @ 10¢  
No. 19, per doz. \$10.00..... 50¢ @ 10¢  
No. 20, per doz. \$10.00..... 50¢ @ 10¢

**Garden Tool Sets—**  
Pt. Madison Rakes, Shovel and Hoe..... \$9.00

**Nail—**  
Round, assorted..... gro. \$3.25 @ 3.75  
Octagon..... gro. \$3.25 @ 3.75  
Knurled, Good..... gro. \$5.00 @ 5.50  
Buck Brothers..... 27¢  
Cannon's Diamond Point, per gr. \$13.35  
Sells' Cornu-ated Cup Pt..... 50¢  
Snell's Knurled Cup Pt..... 60¢

**Rivet—**  
Regular list..... 70¢ @ 10¢ @ 10¢  
Aiken's Genuine..... per doz. \$5.50 @ 6.00

Aiken's Imitation..... per doz. \$0.00 @ 0.10  
Aiken's Criterion..... 40¢  
Aiken's Adjustable..... 40¢  
Bemis & Call Co.'s Cross Cut..... 30¢  
Bemis & Call Co.'s Plate..... 30¢  
Bemis & Call Spring Hammer..... 30¢  
Diston's Star and Monarch..... 35¢  
Hammer, Bemis & Call Co.'s new Pat. 45¢  
Morrill's No. 1, \$15.00..... 40¢ @ 20¢  
Nos. 3 and 4, Cross Cut, \$23.00, 40¢ @ 20¢  
No. 5, Mill, \$31.00..... 40¢ @ 20¢  
No. 10, \$15.00..... 40¢ @ 20¢  
No. 11, \$16.00..... 40¢ @ 20¢  
Taintor Positive, per doz. \$18..... 60¢

**Sharpeners, Knife—**  
Chicago Wheel & Mfg. Co..... 60¢ @ 65¢  
Tanite Mills, per gross, \$14.40..... 35¢ @ 39¢  
**Sharpeners, Skate—**  
Eureka Skate Sharpener..... per doz. \$2.00

**Shaves Spoke—**  
Iron..... doz. \$1.00 @ 1.25  
Wood..... doz. \$1.75 @ 2.25  
Bailey's (Stanley R. & L. Co.)..... 50¢ @ 10¢  
Goodell's, per doz. \$9.00..... 15¢ @ 10¢

**Shears—**  
Cast Iron..... 7 8 9 in.  
Best..... \$16.00 13.00 10.00 gro.  
Good..... \$13.00 10.00 7.00 gro.  
Cheap..... \$5.00 6.00 7.00 gro.  
**Straight Trimmers, &c.—**  
Best quality, Jan. 60¢ @ 10¢ @ 70¢ @ 5¢  
Nickel..... 60¢ @ 60¢ @ 5¢  
Fair qual. Jan. 75¢ @ 10¢ @ 80¢  
Nickel..... 70¢ @ 10¢ @ 75¢

**Tailors' Shears—**  
Acme Cast Shears..... 40¢ @ 40¢  
Heinrich's Tailors' Shears..... 40¢ @ 40¢  
Seymour's, 14..... 60¢  
Seymour's Nickel..... 60¢  
Seymour's Tailors' Shears..... 40¢  
Wilkinson's Heide..... 50¢  
Wilkinson's Sheep..... 15¢

**Tinnars' Snags—**  
Forged Handles, Steel Blades, 20¢ @ 10¢  
Malleable Handles, Laid with Steel..... 40¢  
Forged Handles, Steel Blades, Berlin..... 40¢ @ 10¢  
Jennings & Griffin Mfg. Co.'s 7 to 10 inch..... 50¢  
Niagara Snips..... 40¢  
Seymour's..... 40¢ @ 40¢  
Seymour's Nickel..... 60¢  
Seymour's Tailors' Shears..... 40¢  
Wilkinson's Heide..... 50¢  
Wilkinson's Sheep..... 15¢

**Sheaves—Sliding Door—**  
Stowell's Anti-Friction..... 50¢  
Patent Roller..... 60¢ @ 10¢ @ 10¢  
Patent Roller Hatfield's, Sargent's Hatfield's..... 80¢ @ 10¢ @ 10¢  
Reading..... 70¢ @ 10¢ @ 75¢  
R. & E..... 60¢ @ 10¢ @ 10¢  
Sargent's list..... 50¢ @ 10¢

**Shells—**  
Shells, Empty—  
Brass Shells, Empty:  
First quality, all gauges..... 60¢ @ 5¢  
Climax, Club, Rival, 10 and 12 gauge..... 65¢ @ 5¢  
Paper Shells, Empty:  
Acme, Ideal, Leader, New Rapid, S socketless 10, 12, 16 and 20 gauge..... 35¢ @ 10¢  
Blue Rival, New Climax, Primrose, Club, Yellow Rival, 10, 12, 16 and 20 gauge..... 15¢  
Climax, Club, League, Rival, 14, 16 and 20 gauge (\$7.50 H. I.)..... 30¢ @ 25¢  
Climax Club, League, Rival, 10 and 12 gauge..... 25¢ @ 5¢  
Defiance, High Base, New Victor, Nitro, Repeater, 10, 12, 16 and 20 gauge..... 15¢  
Trap and Metal Lined, 10, 12, 16 and 20 gauge..... 35¢ @ 10¢ @ 5¢

**Shells, Loaded—**  
Loaded with Black Powder..... 40¢ @ 5¢  
Loaded with Nitro Powder..... 40¢ @ 10¢ @ 5¢

**Shoes, Horse, Mule, &c.—**  
Factory Shipments:  
Horse and Mule, per keg..... \$3.00 @ 3.50  
Barden's, all sizes..... \$3.00  
Bryden, Phoenix, Perkins, &c., \$3.75..... 5¢  
Diamond State, Crescent &c., \$3.75..... 10¢  
Schoenberger..... \$3.25  
NOTE.—There is a good deal of unevenness in current prices, whether from manufacturers or jobbers.

**Shot—**  
Drop, up to B, 25-lb. bag..... \$1.30 @ 1.50  
Drop, up to B, 5-lb. bag..... 35¢  
Buck, 25 lb. bag..... \$1.55 @ 1.65  
Buck, 5-lb. bag..... 40¢  
Chilled, 25 lb. bag..... \$1.60 @ 1.63  
Dust Shot, 25 lb. bag..... \$2.00 @ 1.20  
Dust Shot, 5-lb. bag..... 50¢

**Shovels and Spades—**  
No. 2, Polished, Sq. or Rd. Point, D or L Handle:  
1st Grade..... 2d Grade  
Plain Back..... \$10.50 \$9.60  
Strap Back..... 5.00 9.00  
Cleveland Pat'n..... 10.30 9.30  
CS, D, 4th Grade  
Plain Back..... \$8.70 \$8.10  
Strap Back..... 8.10 7.50  
Cleveland Pat'n..... 8.60 7.80  
All other sizes add 30¢ doz.  
Black deduct 30¢ doz.

Note.—The above are the regular Association prices to small retailers, but are often shaded by jobbers \$0.50 @ 1.00



**Shovels and Tongs—**

Brass Head ..... 60¢@80¢@10¢  
 Iron Head ..... 60¢@80¢@10¢

**Sieves and Sifters—**

Hunter's Imitation, gro. \$11.00@12.00  
 Buffalo Metallic Blue, S. & Co., 7 gr.:  
 14x16 ..... 16x18 ..... 18x20 .....  
 \$12.90 ..... \$13.80 ..... \$15.00 .....  
 Eclipse ..... 7 gr. \$10.00  
 Electric Light ..... 7 gr. \$12.00  
 Hunter's Genuine ..... 7 gr. \$12.50  
 Shaker (Barley's Pat.) Flour Sifters .....  
 7 doz., \$2.00

**Sieves, Wooden Rim—**

Nested, 10, 11 and 12 Inch.  
 Mesh 10, Nested, doz. \$0.75@0.90  
 Mesh 20, Nested, doz. .35@0.50  
 Mesh 24, Nested, doz. 1.00@1.05

**Sinks—****Cast Iron—**

Standard list ..... 60¢@80¢@10¢  
 NOTE.—There is not entire uniformity  
 in lists used by jobbers.

**Wrought Steel—**

Columbus Galv'd and Enamelled, 60x35  
 Columbia, Painted ..... 45¢  
 L. & G. Mfg. Co., Galvanized ..... 50¢  
 L. & G. Mfg. Co., Enamelled ..... 60¢

**Skells, Wagon—**

Cast Iron ..... 70¢@10¢@15¢  
 Malleable Iron ..... 40¢@10¢@50¢  
 Steel ..... 35¢@10¢@40¢

**Slates—**

"D" Slates ..... 60¢@10¢@50¢@10¢  
 Unexcelled Noiseless Slates .....  
 60x60 tens@60x60 tens@5¢  
 Wire Bound ..... 40¢@10¢@50¢  
 Double Slates, add \$1 case, net.

**Slaw Cutters—See Cutters.****Slicers, Vegetable—**

Sterling \$ 3.00 ..... 33¢@5¢

**Snap, Harness—**

German ..... 40¢@10¢@10¢  
 Covert Mfg. Co.:  
 Derby ..... 35¢@5¢  
 High Grade ..... 45¢@5¢  
 Jockey ..... 45¢@5¢  
 Trojan ..... 45¢@5¢  
 Covert's Saddlery Works:  
 Banner ..... 60¢@10¢  
 Crown ..... 60¢@10¢  
 Triumph ..... 60¢@10¢  
 W. & E. T. Hitch Co.:  
 Bristol ..... 40¢@10¢  
 Empire ..... 50¢@5¢  
 German ..... 40¢  
 National ..... 50¢@5¢  
 Perfect ..... 45¢  
 Clipper ..... 60¢@5¢  
 Champion ..... 40¢  
 Security ..... 40¢  
 Victor ..... 60¢@5¢  
 Oneda Community:  
 Solid 6 Steel ..... 65¢@5¢@10¢  
 Solid 3 Wire ..... 65¢@10¢@15¢@10¢  
 Sargent's Patent Guarded ..... 60¢@10¢

**Snaths—**

Scythe ..... 45¢@5¢

**Snips, Tinnors'—See Shears.****Soldering Irons—**

See Irons, Soldering.

**Spoke Trimmers—**

See Trimmers, Spoke.

**Spoons and Forks—****Silver Plated—**

Flat Ware ..... 60¢@10¢@50¢@10¢  
 Wm. Rogers Mfg. Co. .... 50¢@10¢

**Miscellaneous—**

German Silver ..... 60¢@10¢  
 Wm. Rogers Mfg. Co.:  
 18 German Silver ..... 60¢  
 Rogers' Silver Metal ..... 50¢@10¢  
 Victor (Coll.) ..... 50¢@10¢@10¢

**Springs—****Door—**

Gem (Coll.) ..... 20¢  
 Star (Coll.) ..... 30¢  
 Torrey's Rod, 30 in. 7 doz. \$1.10@1.25  
 Warner's No. 2, 7 doz. \$3.50; No. 3,  
 \$5.00; No. 4, \$6.00; No. 5,  
 \$7.00 (Coll.) ..... 50¢@10¢@10¢

**Carriage, Wagon, & Co.**

Factory Shipments.  
 1 1/4 in and wider ..... 4 1/4 4 1/2 4 3/4 4 1/2  
 Collie's Bolster Springs ..... 35¢  
 Collie's Seat Springs ..... 7 pair 55¢

**Sprinklers, Lawn—**

Enterprise ..... 25¢@30¢  
 Philadelphia No. 1, 7 doz. \$12; No. 2,  
 \$15; No. 3, \$24 ..... 30¢

**Squares—**

Nickel plated ..... 1 List Jan. 5, 1900  
 Steel and Iron ..... 70¢@...  
 Rosewood Hdl. Try Square and T.  
 Bevel ..... 60¢@10¢@10¢@10¢  
 Iron Hdl. Try Squares and T. Bevels,  
 40¢@10¢@10¢@10¢

**Diston's Try Sq. and T. Bevel**

Winterbottom's Try and Miter ..... 50¢@10¢

**Squeezers—****Lemon—**

Wood, Common, gro., No. 0, \$5.25  
 @ \$5.50; No. 1, \$5.25@ \$5.50.  
 Wood, Porcelain Lined:  
 Cheap ..... doz. \$2.00@ \$2.75  
 Good Grade ..... doz. \$3.00@ \$3.50

Tinned Iron ..... doz. \$0.75@1.25  
 Iron, Porcelain Lined doz. \$2.50@3.50  
 Jennings' Star ..... 7 doz. \$1.85@1.95  
 King ..... 7 doz. \$2.00

**Staples—**

Barbed Blind ..... 1b. 8¢@9¢  
 Electricians', Association list, 7¢@10¢  
 Fence Staples, same price as Barbed  
 Wire. See Trade Report.  
 Poultry Netting, Staples, per lb. 5c.  
 Grand Crossing Tack Co.'s list ..... 80¢@10¢

**Steels, Butchers'—**

Dick's ..... 40¢  
 Foster Bros' ..... 30¢  
 C. & A. Hoffmann's ..... 40¢  
 Nichols Bros. .... 50¢

**Steelyards..... 25¢@25¢@10¢****Stocks and Dies—**

Blacksmiths' ..... 40¢@10¢@10¢  
 Garliner Die Stocks ..... 50¢  
 Garliner D & Stocks, larger sizes ..... 40¢  
 Green River ..... 25¢  
 Lightning Screw Plate ..... 25¢  
 Little Giant ..... 25¢  
 Reo's New Screw Plates ..... 25¢@30¢  
 Curtis Reversible Ratchet Die Stock, 35¢

**Stone—****Soythe Stones—**

Chicago Wheel & Mfg. Co.:  
 Gem Corundum, 10 inch, \$10.50 per  
 gro., 12 inch, \$12.00  
 Cleveland Stone Co., list Nov., '99, 33¢@4¢  
 Pike Mfg. Co., list '95-'99 ..... 33¢@4¢

**Oil Stones, & Co.**

Chicago Wheel & Mfg. Co.:  
 Corundum Oil, Double Grit ..... 50¢  
 Corundum Axe Stones, Slips, etc. .... 35¢  
 Pike Mfg. Co.:  
 Hindustan No. 1, 7 D. 8¢  
 Band Stone ..... 33¢@4¢  
 Turkey Oil Stone, Extra ..... 33¢@4¢  
 Turkey Slips ..... \$1.50  
 Lily White Washita ..... 60¢  
 Rosy Red Washita ..... 60¢  
 Washita Stone, No. 1 ..... 40¢  
 Washita Stone, No. 2 ..... 30¢  
 Lily White Slips ..... 30¢  
 Rosy Red Slips ..... 30¢  
 Washita Slips, Extra ..... 30¢  
 Washita Slips, No. 1 ..... 70¢  
 Arkansas Stone, No. 1, 7 doz. \$3.50  
 Arkansas Stone, No. 1.5, 7 doz. \$3.50  
 India Oil Stones ..... 25¢  
 Tangle Mills:  
 Emery Oil, 7 doz. \$5.00 ..... 50¢@60¢

**Stoners—****Cherry—**

Enterprise ..... 25¢@30¢

**Stops, Bench—**

Millers Falls ..... 15¢@10¢  
 Morrill's ..... 7 doz. No. 1, \$10.00; No. 2,  
 \$11.00, 40¢@20¢

**Stops, Window—**

Ives' Patent ..... 25¢@5¢  
 Wilcox, Steel, per doz., \$0.00 ..... 50¢

**Stove Boards—**

See Boards, Stove.

**Stove Polish—See Polish, Stove.****Strainers, Pump—**

Diamond Joe Pump Strainers, per doz. 75¢

**Straps, Box—**

Cary's Universal case lots ..... 20¢@10¢

**Stretchers, Carpet—**

Cast Iron, Steel Points ..... doz. 55¢@65¢  
 Cast Steel, Polished ..... doz. \$2.25  
 Socket ..... doz. \$1.75

**Stuffers, Sausage—**

Mill's Challenge, 7 doz. \$20 ..... 50¢@50¢@5¢  
 Enterprise Mfg. Co. .... 25¢@25¢@1¢  
 National Specialty Mfg. Co., list Jan.  
 1, '97 ..... 30¢

**Tacks Brads, & Co.—**

See Trade Report.  
 List Jan. 15, '99.  
 Carpet Tacks, American ..... 90¢@40¢  
 American Cut Tacks ..... 80¢@30¢  
 Swedes Iron Tacks ..... 90¢@40¢  
 Swedes Upholsterers' Tacks .....  
 Gimp Tacks ..... 90¢@40¢  
 Lace Tacks ..... 90¢@40¢  
 Trimmers' Tacks ..... 90¢@40¢  
 Looking Glass Tacks ..... 70¢@10¢  
 Bill Posters' and Railroad Tack .....  
 Hungarian Nails ..... 80¢@25¢  
 Common and Patent Brads, 70¢@10¢  
 Trunk and Clout Nails ..... 80¢@10¢  
 NOTE.—The above prices are for  
 straight weights. An extra 5% is given  
 Star Weights and an extra 10% on  
 Standard Weights.

**Miscellaneous—**

Double Point Tacks ..... 90¢ 7 or 8 tens  
 Steel Wire Brads, R. & E. Mfg.  
 Co.'s list ..... 50¢@10¢@10¢  
 See also Nails, Wire.

**Tanks, Oil—**

Emerald, S. S. & Co. .... 30-gal. \$9.20  
 Emerald, S. S. & Co. .... 60-gal. \$14.00  
 Queen City S. S. & Co., 60-gal. \$9.50  
 Queen City S. S. & Co., 60-gal. \$4.35

**Tapes, Measuring—**

American Asse's Skin ..... 40¢@10¢@50¢  
 Patent Leather ..... 25¢@20¢  
 Steel ..... 10¢@0¢5¢  
 Chesterman's ..... 25¢@25¢@5¢

Eddy's Steel ..... 40¢@40¢5¢  
 Eddy's Metallic ..... 33¢@33¢45¢  
 Keuffel & Esser Co., Steel and Metallic,  
 Lower list, 1899 ..... 35¢  
 Lufkin's Steel ..... 33¢@35¢  
 Lufkin's Metallic ..... 30¢@30¢5¢

**Thermometers—**

Tin Case ..... 80¢@80¢@10¢

**Ties, Bale—Steel.**

Standard Wire ..... 50¢@10¢@5¢

**Ties, Wall—**

Cleveland Wire Spring Co.:  
 Galv. Steel 5-32 x 8 1/4 in. \$ 1000 \$10.00  
 Galv. Steel 5-32 x 8 1/4 in. \$ 1000 \$11.00  
 Galv. Steel 5-32 x 1 1/4 in. \$ 1000 \$12.00  
 Galv. Steel 5-32 x 1 1/4 in. \$ 1000 \$14.00

**Tinners' Shears, & Co.—**

See Shears, Tinners', & Co.

**Tinware—**

Stamped, Japanned and Pieced, sold  
 very generally at net prices.

**Tire Benders, Upsetters, & Co.—See Benders and Upsetters, Tire.****Tobacco Cutters—**

See Cutters, Tobacco.

**Tools—****Coopers'—**

L. & I. J. White ..... 20¢@20¢@5¢

**Saw—**

Atkins' new list ..... 40¢  
 Simonds' Improved ..... 33¢@5¢  
 Simonds' Crescent ..... 25¢

**Ship—**

L. & I. J. White ..... 25¢

**Transom Lifters—**

See Lifters, Transom.

**Traps—Game—**

Oneda Pattern ..... 70¢@10¢@75¢@10¢  
 Newhouse ..... 45¢@5¢  
 Hawley & Norton ..... 65¢@5¢  
 Victor (Oneda Pattern) ..... 75¢@75¢@10¢  
 Star (Blake Pattern) ..... 65¢@10¢@70¢@5¢

**Mouse and Rat—**

Mouse, Wood, Choker, doz. holes? 9¢@5¢  
 Mouse, Round or Square Wire .....  
 doz. \$0.85@1.00  
 Diamond Joe Mouse Traps, per doz. 60¢  
 Diamond Joe Rat Traps, per doz. \$1.00  
 Marty French Rat and Mouse Traps  
 (Genuine):  
 No. 1, Rat, 7 doz. \$12.00; case of 24  
 \$10.50  
 No. 2, Rat, 7 doz. \$5.50; case of 50  
 \$5.00  
 No. 3, Rat, 7 doz. \$4.50; case of 72  
 \$4.00  
 No. 4, Mouse, 7 doz. \$3.50; case of 72  
 \$2.75  
 No. 5, Mouse, 7 doz. \$2.75; case of 150  
 \$2.25  
 Schuyler's Rat Killer, No. 1, 7 gr. \$30.00;  
 No. 2, 7 gr. \$30.00; Mouse, No. 3,  
 \$18.00 ..... 50¢

**Fly—**

Balloon, Globe or Acme .....  
 doz. \$1.15@1.25; gro. \$12.00@14.00  
 Harper, Champion or Paragon .....  
 doz. \$1.25@1.40; gro. \$15.50@18.00

**Trimmers, Spoke—**

Bonney's No. 1 and 2 ..... 40¢  
 Stearns ..... 25¢

**Trowels—**

Diamond Brick and Pointing ..... 30¢  
 Diston Plastering ..... 25¢  
 Diston "Standard Brand" and Ga-  
 den Trowels ..... 40¢  
 New-Break Steel Garden Trowel .....  
 gro. \$7.00  
 Peace's Plastering ..... 30¢  
 Rose Brick and Plastering ..... 25¢@5¢  
 Woodrugh & McParlin, Plastering, 25¢@10¢

**Trucks, Warehouse, & Co.—**

R. & L. Block Co.'s list ..... 40¢  
 Daisy Stove Trucks, Improved pattern  
 7 doz. \$21.00  
 Model Stove Trucks ..... 7 doz. \$18.50

**Tubs, Wash—**

No. 1 2 3  
 Galvanized, per doz. \$5.00 5.50 6.00  
 Galvanized Wash tubs (S. S. & Co.):  
 No. 1 3 10 30 30  
 Per doz \$5.25 6.00 6.75 6.50 7.25 8.00

**Twine—**

Miscellaneous—  
 Flax Twine— BC B.  
 No. 2, 1/4 and 1/2-lb. Balls ..... 55¢ 55¢  
 No. 1, 1/4 and 1/2-lb. Balls ..... 19¢ 25¢  
 No. 2, 1/4 and 1/2-lb. Balls ..... 18¢ 19¢  
 No. 2, 1/4 and 1/2-lb. Balls ..... 15¢ 15¢  
 No. 2, 1/4 and 1/2-lb. Balls ..... 15¢ 15¢  
 Chalk Line, Cotton, 1/4-lb. Balls .....  
 18¢@30¢  
 Cotton Mops, 6, 9, 12 and 15 lb. to  
 doz ..... 7¢@8¢  
 Cotton Wrapping, 5 Balls to lb .....  
 9¢@16¢  
 American 2-Ply Hemp, 1/4 and 1/2-lb.  
 Balls ..... 12¢@13¢  
 American 3-Ply Hemp, 1-lb. Balls .....  
 12¢@13¢  
 India 2-Ply Hemp, 1/4 and 1/2-lb.  
 Balls (Spring Twine) ..... 10¢  
 India 3-Ply Hemp, 1-lb. Balls ..... 10¢

India 2-Ply Hemp, 1/4-lb. Balls ..... 9¢  
 2, 2, 1 and 2-Ply Jute, 1/2-lb. Balls .....  
 8¢@9¢  
 Mason Line, Linen, 1/2-lb. Balls ..... 45¢  
 No. 26, Mattress, 1/4 and 1/2-lb. Balls ..... 35¢  
 Wool ..... 7¢

**Vises—**

Solid Box ..... 40¢@50¢  
 Bonney's Saw Vises ..... 40¢@10¢

**Parallel—**

Athol Machine Co.:  
 Simpson's Adjustable ..... 40¢  
 Standa d ..... 40¢  
 Amateur ..... 25¢  
 Bonney's ..... 40¢@10¢  
 Fisher & Norris Double Screw ..... 15¢@10¢  
 Holland's ..... 40¢  
 Macintosh's ..... 40¢  
 Key ions ..... 70¢  
 Lewis Tool Co ..... 20¢@30¢  
 Massey's Perfect ..... 15¢@20¢  
 Massey's Clincher ..... 36¢@40¢  
 Merrill's ..... 30¢  
 Miller's Falls ..... low list 10¢  
 Parker's ..... 20¢@25¢  
 Regular ..... 20¢@25¢  
 Vulcan's ..... 40¢@45¢  
 Combination Pipe ..... 55¢@60¢  
 Prentiss ..... 20¢@25¢  
 Sargent's ..... 40¢  
 Simpson's Adjustable ..... 40¢  
 Sneliker's X. L. ..... 20¢@25¢  
 Stephens ..... 20¢@25¢  
 Toles' Woodworking ..... 25¢  
 Van, W. & W. Hdw. Co. .... 40¢

**Saw Filers—**

Bonney's No. 1, \$13; No. 3, \$16, 50¢@10¢  
 Diston's D S Clamp and Guide, 7 doz. \$40  
 Reading ..... 40¢@10¢  
 Westworth's Rubber Jaw, Nos. 1, 2  
 and 3 ..... 30¢@75¢

**Miscellaneous—**

Signal & Keeler Combination Pipe  
 Vise ..... 60¢  
 Parker's Combination Pipe:  
 NT Series ..... 60¢  
 187 Series ..... 60¢@5¢  
 No. 870 ..... 40¢

**Wads—Price Per M.**

B. E., 11 up ..... 60¢  
 B. E., 9 and 10 ..... 70¢  
 B. E., 8 ..... 80¢  
 B. E., 7 ..... 80¢  
 P. E., 11 up ..... \$1.00  
 P. E., 9 and 10 ..... 1.25  
 P. E., 8 ..... 1.50  
 P. E., 7 ..... 1.60  
 Ely's B. E., 11 and larger ..... \$1.70@1.75  
 Ely's P. E., 12 to 20 ..... \$3.00@3.25

**Wagon Jacks—**

See Jacks, Wagon.

**Ware, Hollow—****Aluminum—**

S. S. & Co. Reduced List ..... 40¢

**Cast Iron, Hollow—**

Stove Hollow Ware:  
 Ground ..... 65¢@65¢@10¢  
 Unground ..... 70¢@70¢@10¢  
 White Enamelled Ware:  
 Main Kettles ..... 80¢@80¢@10¢  
 Boilers and Saucepans ..... 50¢@60¢  
 Tinned Boilers and Saucepans .....  
 60¢@60¢@10¢

**See also Pots, Glue.****Enamelled—**

Agate Nickel Steel Ware, list July '99, 35¢  
 Granite Ware, list Jan. 1, '94, revised  
 Jan. 2, '95 ..... 40¢@10¢  
 Second quality, Agate Nickel Steel ..... 10¢  
 Second quality, Granite ..... 70¢@10¢@70¢@10¢@10¢

**Iron Clad—**

P. E. pored Ware, high list ..... 70¢  
 Mottled Ware, high list ..... 75¢  
 Never Break Enamelled ..... 80¢@50¢@10¢

**Tea Kettles—**

Galvanized Tea Kettles:  
 Inch ..... 6 7 8 9  
 Each ..... 15¢ 60¢ 55¢ 65¢

**Steel Hollow Ware.**

Avery Spiders & Griddles ..... 65¢@55¢@5¢  
 Avery Kettles ..... 60¢  
 P. E. re-clad ..... 60¢@50¢@10¢  
 Never Break Spiders and Griddles .....  
 65¢@55¢@5¢  
 Never Break Kettles ..... 60¢@55¢@10¢  
 Solid Steel Spiders & Griddles ..... 65¢@55¢  
 Solid Steel Kettles ..... 60¢  
 Solid Steel Ware, Enamelled ..... 50¢@55¢

**Silver Plated Hollow—**

William Rogers Mfg. Co. .... 40¢@19¢

**Washboards—**

Solid Zinc: 7 doz  
 Crescent, family size, bent frame, \$3.00

**Washers—****Leather, Axle—**

*Solid*.....80¢10¢10¢85¢  
*Patent*.....85¢85¢55¢  
*Coll.* 1/4 1 1 1/2 1 3/4 1 1/2  
 11c 11c 15c 15c per 100

**Iron or Steel**

Size bolt ... 5-16 3/4 1/2 5/8 3/4  
 Washers.....\$5.60 4.70 3.0 3.30 3.00  
 In lots less than one keg add 1/4c per  
 lb., 5-lb. boxes add 1/4c to list.

**Cast washer—**

Over 1/4 inch barrel lots .....per lb., 2c

**Washer Cutters—**

See Cutters, Washer.

**Washing Machines—**

See Machines, Washing.

**Water Coolers—**

See Coolers, Water.

**Weaners—**

Tyler's New Heater, No. 1, 2 doz. \$3.45;  
 No. 2, \$3.70; No. 3, \$4.00; No. 4, \$4.30  
 Tyler's Heater, Nos. 1 and 2, 2 doz. \$1.70;  
 No. 3, \$2.00; No. 4, \$2.30.

**Wedges—**

Oil Finish.....lb. 5/4c  
 Aze Finish.....lb. 4c

**Weights, Sash—**

Eastern prices.....\$25.00  
 Western prices.....\$30.00  
 Note.—There is a wide difference in  
 prices East and West, and some found-  
 ries are naming lower prices than the  
 above.

**Well Buckets, Galvanized**

See Pails, Galvanized.

**Wheels Well—**

8-in., \$1.75 to \$1.85; 10-in., \$2.25 to \$2.35;  
 12-in., \$2.75 to \$2.85; 14-in., \$3.25 to \$3.40

**Wire and Wire Goods—**

Brt. and Ann., 6 to 9.....70¢10¢  
 Brt. and Ann., 10 to 18.....72¢10¢  
 Brt. and Ann., 19 to 28.....75¢10¢  
 Brt. and Ann., 27 to 38.....75¢10¢  
 Cop'd and Galv., 6 to 9.....60¢10¢  
 Cop'd and Galv., 10 to 18.....70¢  
 Cop'd and Galv., 19 to 28.....70¢10¢  
 Cop'd and Galv., 27 to 38.....72¢10¢  
 Tinned, 6 to 18.....70¢10¢  
 Tinned, 15 to 18.....70¢10¢  
 Tinned, 19 to 28.....70¢10¢  
 Tinned, 27 to 38.....65¢10¢  
 Annealed Wire on Spools.....60¢10¢ to 70¢  
 Brass and Copper Wire on Spools.....50¢10¢ to 60¢  
 Brass, list Feb. 26, '98.....20¢

Copper, list Feb. 26, '98.....15¢  
 Cast Steel Wire.....60¢  
 Stubs' Steel Wire.....\$6.00 to 2, 40¢  
 Wire Clothes Line, see Lines.  
 Wire Picture Cor. 1, see Cord.

**Bright Wire Goods—**

Iron and Brass, list July 1, 1899.....85¢10¢ to 95¢10¢ to 5¢

**Wire Cloth and Netting—**

Galvanized Wire Netting 30¢10¢ to 5¢2¢  
 Painted Screen Cloth per 100 ft.....\$1.30 to 1.40

**Hardware Grade, Iron:**

2 to 20 mesh.....sq. ft. 2 1/4 to 3c  
 20 x 20 mesh.....sq. ft. 3 to 3 1/2c  
 Galv. Hardware Grade, 2 to 5 mesh.....sq. ft. 3 1/4 to 3 1/2c  
 Galv. Hardware Grade, 6 to 8 mesh.....sq. ft. 3 1/4 to 3 1/2c

**Wire Barb—See Trade Report.****Wire, Rope—See Rope, Wire.****Wrenches—**

Agricultural.....70¢10¢ to 70¢10¢ to 5¢  
 Baxter's S.....80¢10¢  
 Coes' Genuine.....40¢10¢ to 5¢5¢  
 Coes' Mechanical.....40¢10¢ to 5¢5¢  
 Acme.....80¢10¢  
 Allen's Pocket (Bright).....50¢10¢  
 Alligator.....60¢10¢ to 10¢

**Bemis & Call's:**

Adjustable S.....35¢5¢  
 Adjustable S Pipe.....40¢  
 Briggs' Pattern.....30¢10¢  
 Combination Black.....40¢5¢  
 Combination Bright.....40¢  
 Cylinder or Gas Pipe.....55¢  
 Extra Heavy.....45¢  
 Merrick's Pattern.....50¢  
 No. 3 Pipe, Bright.....55¢  
 Hindley Automatic.....30¢  
 Boardman's.....30¢  
 Bull Doz, W. & B.....60¢10¢ to 10¢  
 Donohue's Engineer.....40¢10¢  
 Earle.....50¢10¢  
 Hercules.....70¢  
 Solid Handles, P. S. & W.....40¢10¢  
 Stevenson.....60¢10¢ to 10¢

**Wrought Goods—**

Staples, Hooks, &c., list March 17  
 '98.....\$5.25 to 55¢10¢

**Yokes, Neck—**

Covert Sadlery Works, Trimme 1.60 to 5.5¢  
 Covert Saddlery Works, Neck Yoke  
 Centers.....70¢

**Yokes, Ox, and Ox Bows—**

Fort Madison's Farmers & Freighters'..  
 list not

**Zinc—**

Sheet.....lb 6 1/4c to 7c

**PAINTS, OILS AND COLORS.—Wholesale Prices.****White Lead, Zinc, &c.**

Lead, Foreign white, in Oil.....7 1/4 to 9 1/4  
 Lead, American White, in Oil:  
 Lots of 500 lb or over.....@ 6 1/4  
 Lots less than 500 lb.....@ 6 3/4  
 Lead, White, in oil, 25 lb tin  
 pails, add to keg price.....@ 1/4  
 Lead, White, in oil, 13 1/2 lb tin  
 pails, add to keg price.....@ 1  
 Lead, White, in oil, 1 to 5 lb as-  
 sorted tins, add to keg price.....@ 1 1/4  
 Lead, American, Terms: On lots of 500  
 lbs. and over, 60 days, or 95 for cash if  
 paid in 15 days from date of invoice.  
 Zinc, American, dry.....@ 4 1/4 to 4 1/2  
 Zinc, Paris, Red Seal, dry.....@ 8 1/2  
 Zinc, Paris, Green Seal, dry.....@ 9 1/2  
 Zinc, Antwerp Red Seal, dry.....@ 7 1/2  
 Zinc, Antwerp, Green Seal, dry.....@ 9  
 Zinc, V. M. French, in Poppy Oil,  
 Green Seal:  
 Lots of 1 ton and over.....11 1/2 to 12 1/4  
 Lots of less than 1 ton.....12 to 12 1/2  
 Zinc, V. M. French, in Poppy Oil,  
 Red Seal:  
 Lots of 1 ton and over.....10 1/4 to 11  
 Lots of less than 1 ton.....10 1/2 to 11 1/4  
 Discounts.—V. M. French Zinc.—Dis-  
 counts to buyers of 10 bb. lots of one or  
 assorted grades, 1¢; 25 bb. lots, 2¢; 50  
 bb. lots, 4¢.

**Dry Colors.**

Black, Carbon.....@ 8 to 20  
 Black, Drop, Amer.....2 1/4 to 4  
 Black, Drop, Eng.....15 to 31  
 Black, Ivory.....3 to 5  
 Lamp, Com.....3 to 5  
 Blue, Celestial.....@ 5 1/4 to 8  
 Blue, Chinese.....35 to 40  
 Blue, Prussian.....30 to 38  
 Blue, Ultramarine.....3 to 3 1/2  
 Brown, Spanish.....1 1/2 to 1  
 Brown, Vandyke, Amer.....1 1/4 to 2 1/4  
 Brown, Vandyke, Foreign.....2 1/4 to 3 1/4  
 Carmine, No. 40.....@ 2 1/2 to 3 1/2  
 Green, Chrome, ordinary.....5 to 6

Green, Chrome, pure.....18 to 20  
 Lead, Red, bbls. 40 lbs. and kegs:  
 Lots 500 lb or over.....@ 6 1/4  
 Lots less than 500 lb.....@ 6 3/4  
 Litharge, bbls. 40 lbs. and kegs:  
 Lots 500 lb or over.....@ 6 1/4  
 Lots less than 500 lb.....@ 6 3/4  
 Ocher, French Washed.....1 1/4 to 2 1/4  
 Ocher, Dutch Washed.....1 1/4 to 2 1/4  
 Ocher, American.....\$10.00 to 15.00  
 Orange Mineral, English.....@ 9 to 10 1/2  
 Orange Mineral, French.....11 to 12 1/2  
 Orange Mineral, German.....8 1/2 to 9  
 Orange Mineral, American.....8 1/4 to 9 1/4  
 Red, Indian, English.....4 1/4 to 5 1/4  
 Red, Indian, American.....5 to 6 1/4  
 Red, Turkey, English.....4 to 6  
 Red, Tuscan, English.....7 to 10  
 Red, Venetian, Amer.....\$100 to 110  
 Red, Venetian, English.....1.80 to 2.10  
 Sienna, Italian, Burnt and  
 Powdered.....@ 3 1/4 to 4 1/4  
 Sienna, Ital. Raw, Powder.....1 1/4 to 2  
 Sienna, American, Raw.....1 1/4 to 2  
 Sienna, American, Burnt and  
 Powdered.....@ 1 1/2 to 2  
 Talc, French.....\$100 to \$125 to 60¢  
 Talc, American.....90 to 110  
 Terra Alba, French.....95 to 100  
 Terra Alba, English.....95 to 100  
 Terra Alba, American No. 1.....45 to 70  
 Terra Alba, American No. 2.....45 to 50  
 Umber, Turkey, Raw & Powd.....2 1/4 to 3 1/4  
 Umber, Turk. Raw & Powd.....2 1/4 to 3 1/4  
 Umber, Raw, Amer.....1 1/4 to 2  
 Yellow, Chrome.....10 1/2 to 25  
 Vermilion, American Lead.....10 to 25  
 Vermilion, Quicksilver, bulk.....@ 72  
 Vermilion, Quicksilver, bags.....@ 73  
 Vermilion, English, Import.....81 to 95  
 Vermilion Chinese.....88 to 95

**Colors in Oil.**

Black, Lampblack.....10 to 14  
 Blue, Chinese.....30 to 40  
 Blue, Prussian.....34 to 38  
 Blue, Ultramarine.....12 to 16

Brown, Vandyke.....9 1/4 to 13  
 Green, Chrome.....8 to 12  
 Green, Paris.....@ 21  
 Sienna, Raw.....10 to 13  
 Sienna, Burnt.....10 to 13  
 Umber, Raw.....9 to 12  
 Umber, Burnt.....9 1/4 to 12

**Miscellaneous.**

Barytes, Foreign, # ton.....\$19.00 to 21.00  
 Barytes, Amer. doated.....19.00 to 20.00  
 Barytes, Crude.....2.00 to 10.00  
 Chalk, in bulk.....\$100 to 2.75  
 Chalk, in bbls.....@ 35 to 36  
 China Clay, English.....\$100 to 17.50  
 Cobalt, Oxide.....\$100 to 2.50  
 Whiting, common.....\$100 to .52  
 Whiting, Gilders......54 to .64  
 Whiting, extra Gilders......55 to .68

**Putty.**

In bulk.....\$1.90  
 In bladders.....2.40  
 In cans, 12 lb to 25 lb.....2.50  
 In cans, 1 lb to 5 lb.....3.60

**Spirits Turpentine.**

In Southern bbls.....@ 39 to 40  
 In machine bbls.....@ 39 1/2 to 40

**Glue.**

Low Grade.....@ 12 to 15 1/2  
 Cabinet.....13 1/2 to 16 1/2  
 Medium White.....14 1/2 to 16 1/2  
 Extra White.....18 to 23  
 French.....12 to 40  
 Irish.....13 1/4 to 16

**Animal, Fish and Vege-**

table Oils.  
 Linseed, City, raw.....\$ gal. 65 to 67

Linseed, City, boiled.....67 to 69  
 Linseed, Sea and West's raw.....@ 62  
 Linseed, Raw Calcutta seed.....@ 63  
 Lard, Prime.....@ 18 to 19  
 Lard, Extra No. 1.....48 to 49  
 Lard, No. 1.....41 to 43  
 Cotton-seed, Crude.....@ 41  
 Cotton-seed, Summer Yellow,  
 prime.....35 to 37  
 Cotton-seed, Summer Yellow,  
 off grades.....34 to 35  
 Spermin, Crude.....@ 36  
 Spermin, Natural Spring.....@ 36  
 Spermin, Bleached Spring.....@ 36  
 Spermin, Natural Winter.....@ 37  
 Spermin, Bleached Winter.....@ 38  
 Whale, Crude.....@ 38  
 Whale, Natural Winter.....@ 47  
 Whale, Bleached Winter.....@ 49  
 Menhaden, Crude, Sound.....25 to 26  
 Menhaden, Light Striped.....29 to 30  
 Menhaden, Bleached Winter.....35 to 37  
 Menhaden, Extra Bleached.....@ 37  
 Tallow, prime.....49 to 50  
 Coconut, Ceylon.....5 1/4 to 5 1/2  
 Coconut, Cochin.....5 1/4 to 5 1/2  
 Col. Domestic.....30 to 33  
 Col. Newfoundland.....34 to 38  
 Red Blaine.....36 to 38  
 Red Saponified.....36 to 38  
 Olive, Italian, bbls.....55 to 60  
 Neatsfoot, prime.....48 to 50  
 Palm, prime, Lagos.....5 1/2 to 6

**Mineral Oils.**

Black, 20 gravity, 25 to 30 cold  
 test.....\$ gal. 10 1/2 to 11 1/2  
 Black, 30 gravity, 15 cold test.....10 1/2 to 11 1/2  
 Black, 40 gravity.....9 1/2 to 10 1/2  
 Cylinder, light filtered.....14 1/2 to 17 1/2  
 Cylinder, dark filtered.....14 1/2 to 17 1/2  
 Paraffine, 90-907 gravity.....14 1/2 to 15 1/2  
 Paraffine, 90-91 gravity.....14 1/2 to 15 1/2  
 Paraffine, 88-91 gravity.....14 1/2 to 15 1/2  
 Paraffine, red, No. 1.....14 1/2 to 15 1/2  
 In small lots 1/4 advance.

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SEPTEMBER 19, 1900.

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	Ingot—	
Lake, .....	174@174	
Ansonia grade Casting.....	170@174	

Wider than and including	8 12	13 14	14 16	16 18	18 20	20 22	22 24	24 26
To No. 20 inclusive	92	99	95	97	90	81	83	80

tin Plate Scrap.....	gross ton	\$7.00
Wrought Scrap Iron.....	gross ton	\$5.50 @ 9.00
Heavy Cast Scrap.....	gross ton	\$10.00 @ 10.50
Galva. Plate Scrap.....	gross ton	\$4.00 @ 5.00

Stove Plate Scrap.....	gross ton	\$7.00	6.00
Burnt Iron.....	gross ton	\$5.50	6.00



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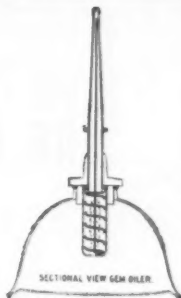
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1875 **COVERT'S** 1900



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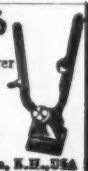


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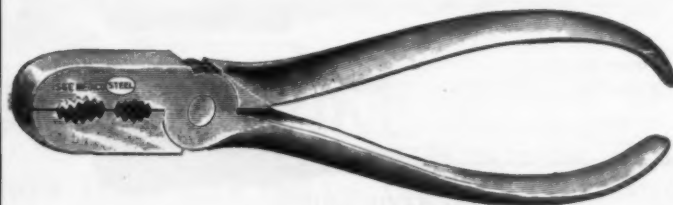
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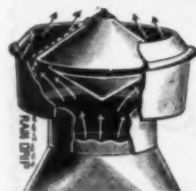
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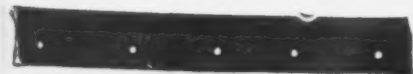
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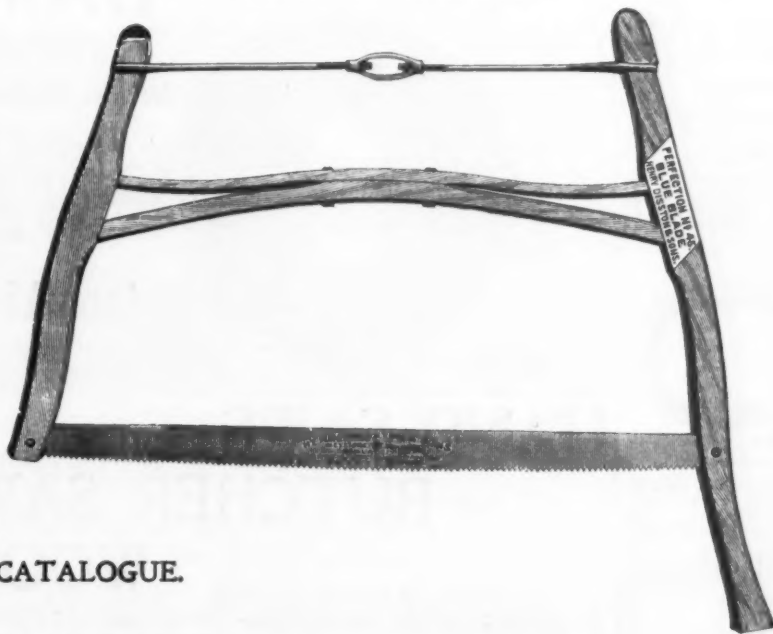
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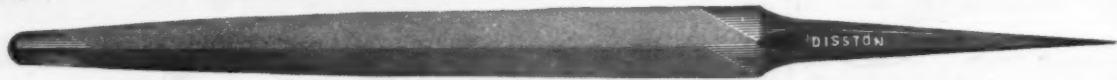
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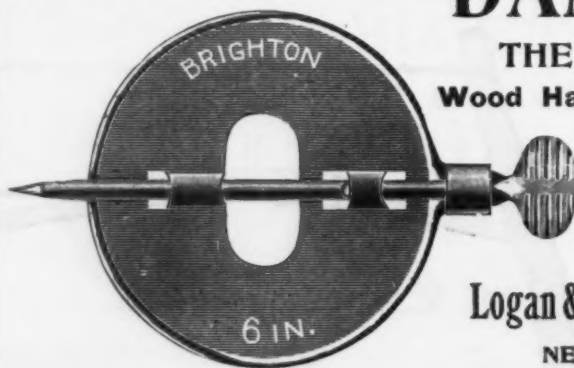
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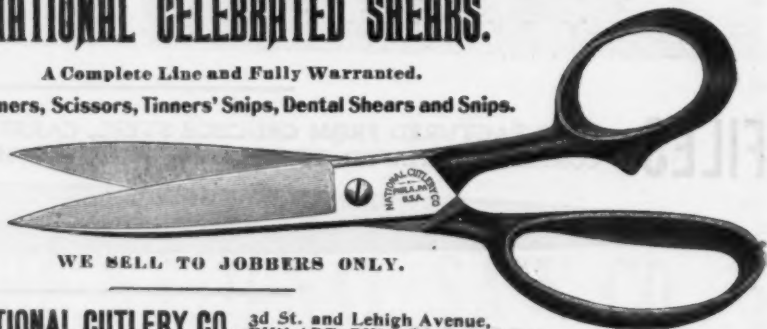
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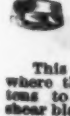
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The  
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AUGERS and  
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**HIGH GRADE AUGER BITS.**  
(BLACK TWIST)**JOB T. PUGH, PHILADELPHIA.**

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Prices Right.

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American Tool Chest Company,  
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Factory and Showroom,

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Also Machinists Tool Chests, empty Tool Cabinets  
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Write us for prices.

We are closing out these sets be-  
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W. Schreyer's Sons &amp; Co.

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THE  
SUPERIORITY OF**Griffin's Improved  
Pressed Steel  
Shelf Bracket**

IS UNQUESTIONED:

Attractive { IN DESIGN,  
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SOLD BY ALL LEADING JOBBERS.

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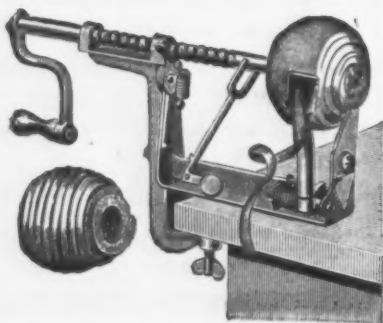
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DOUBLE CUT GIMLET  
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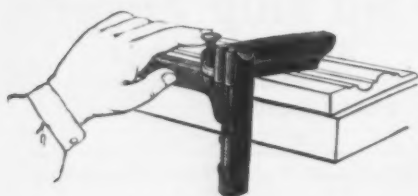
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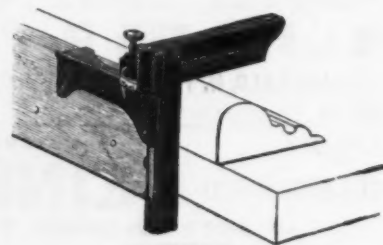
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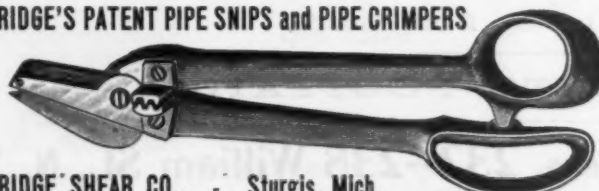


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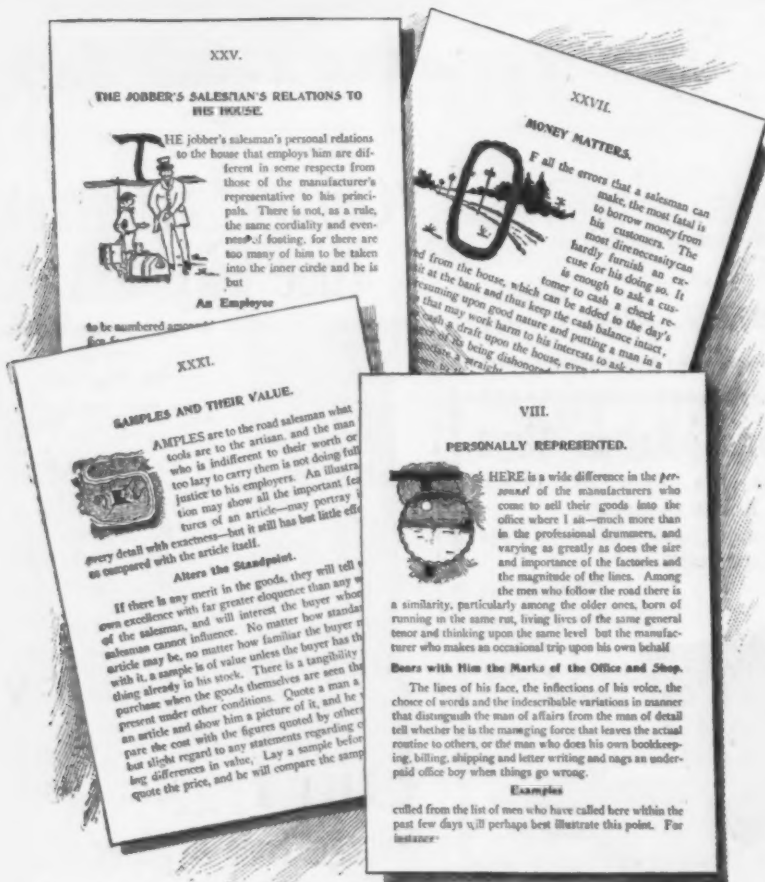
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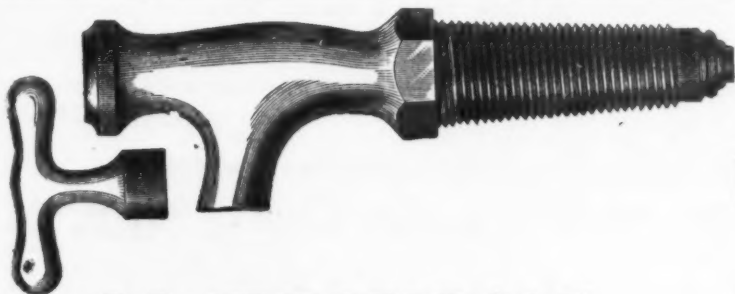
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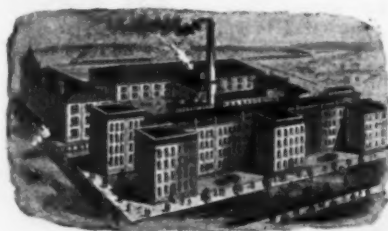
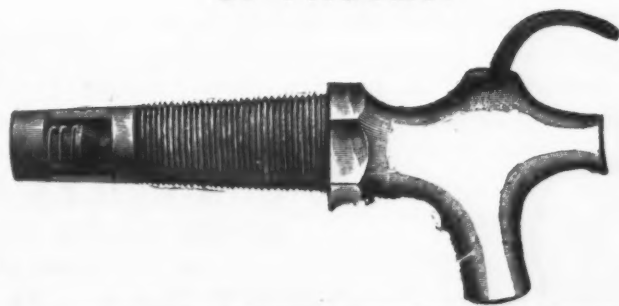
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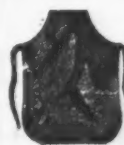
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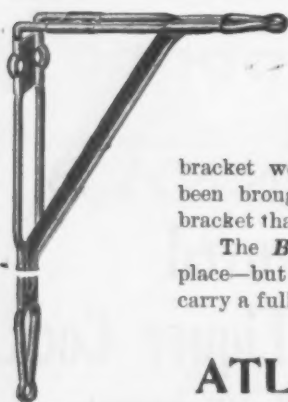
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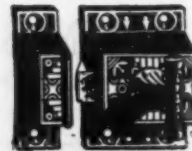
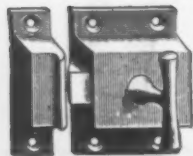
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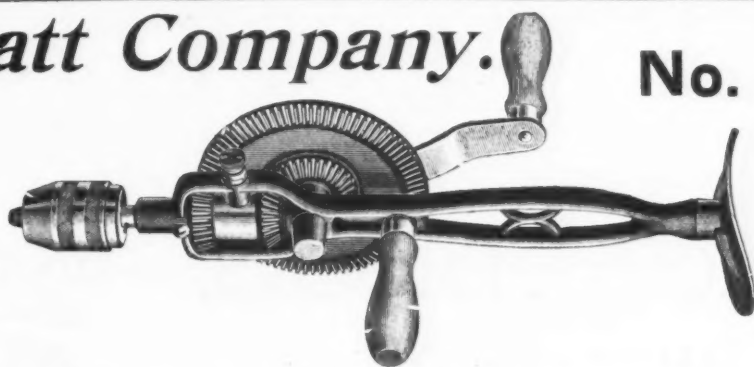
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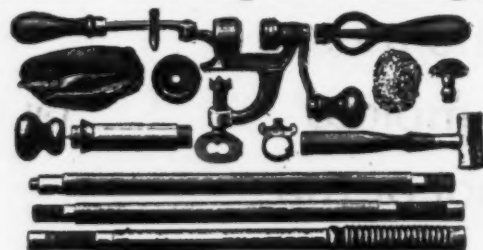
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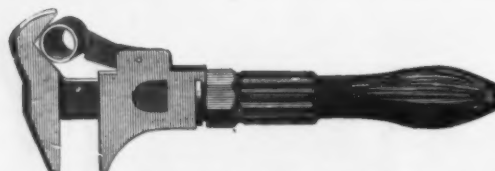
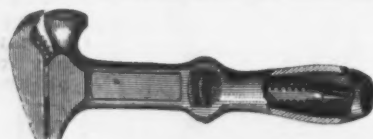
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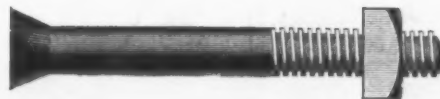
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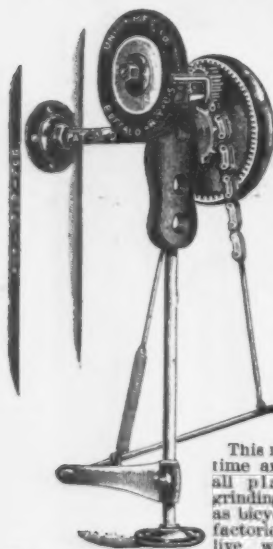
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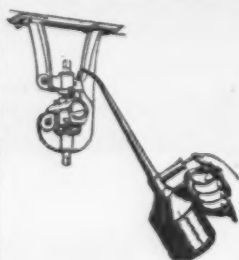
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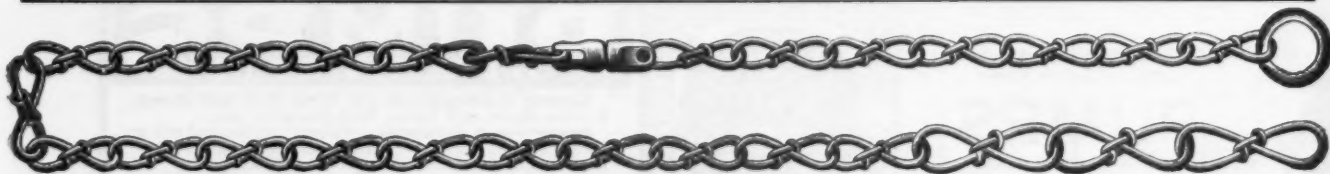
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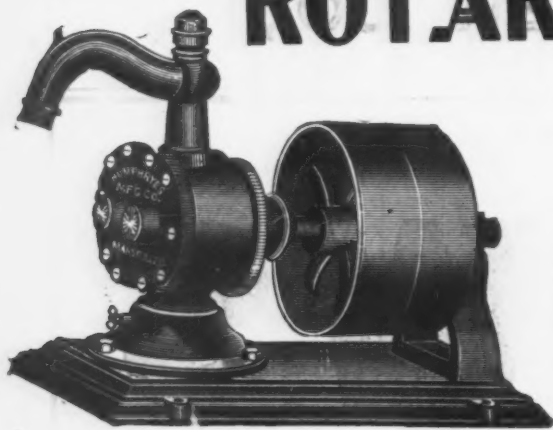
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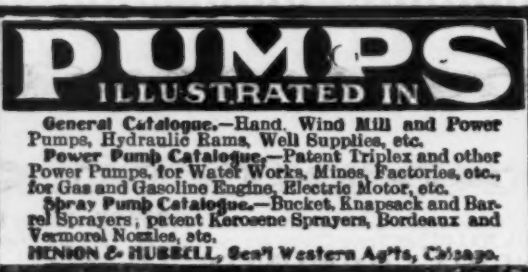
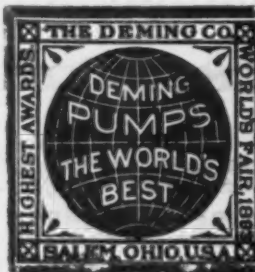
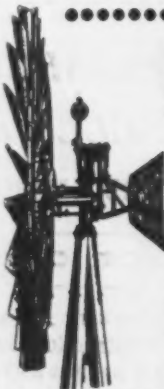
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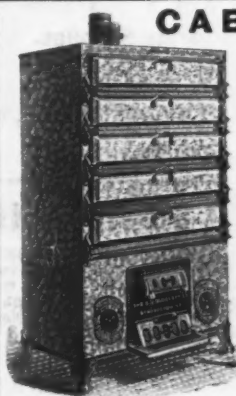
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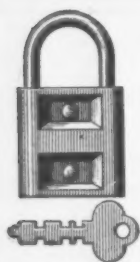
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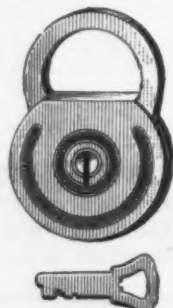
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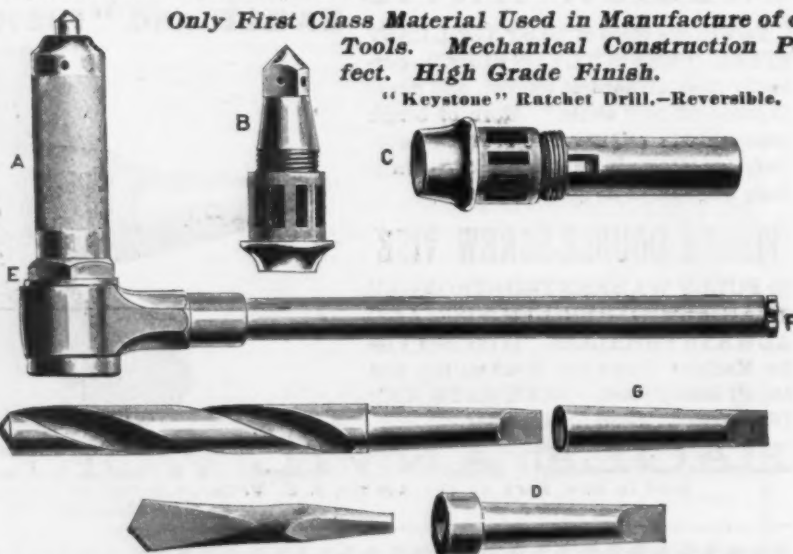
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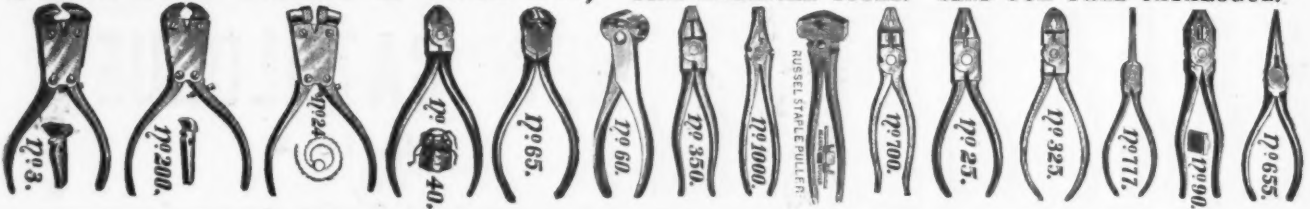
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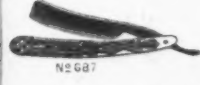
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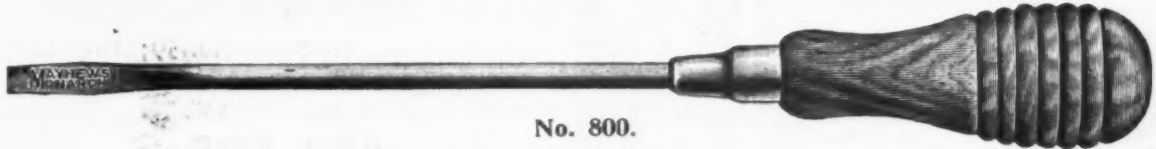
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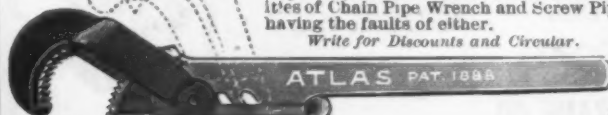


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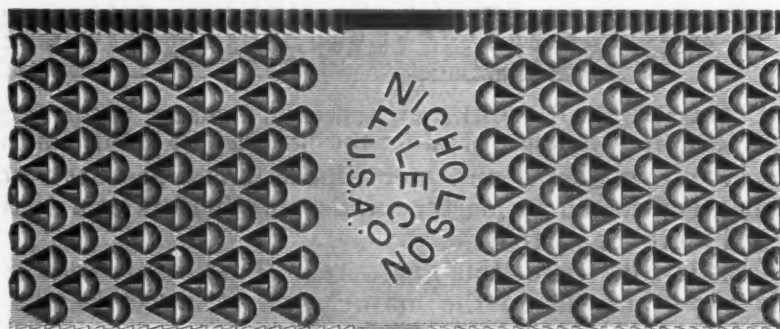
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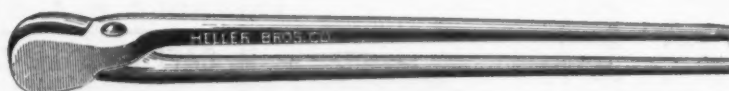
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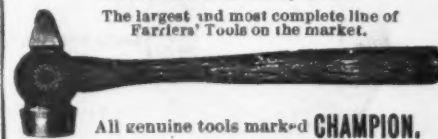
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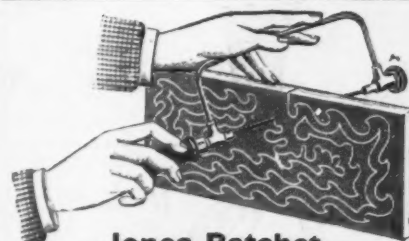
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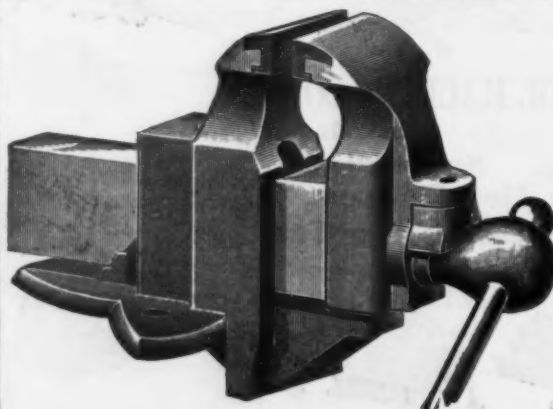


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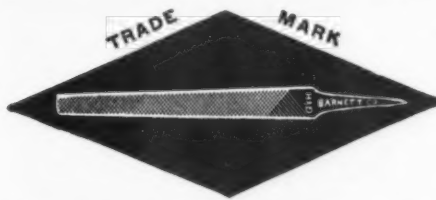
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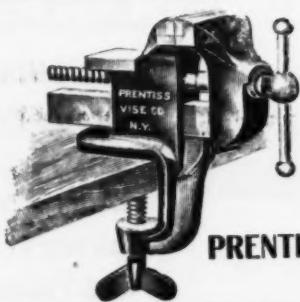


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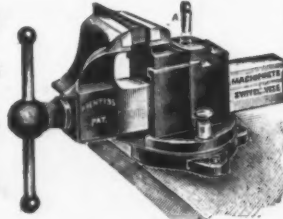
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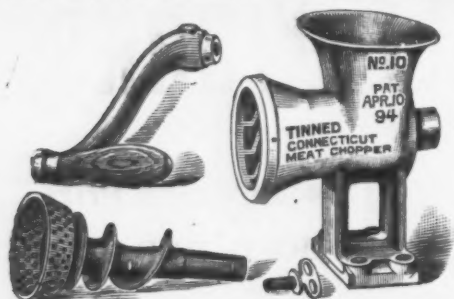
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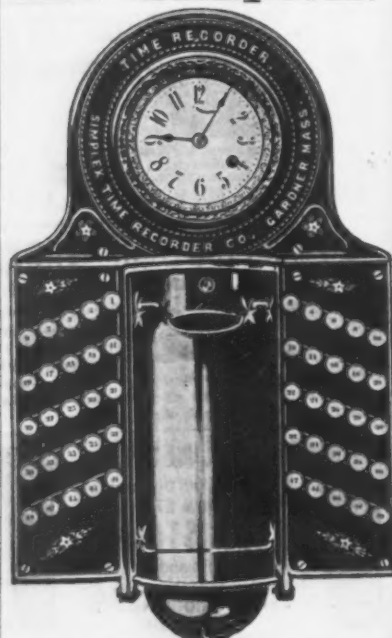
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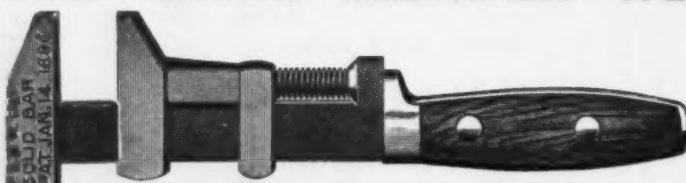
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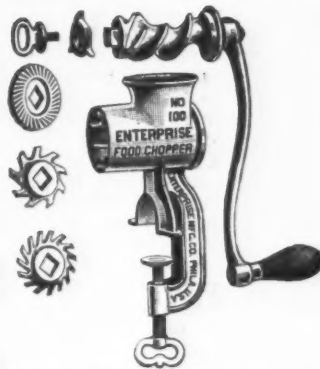
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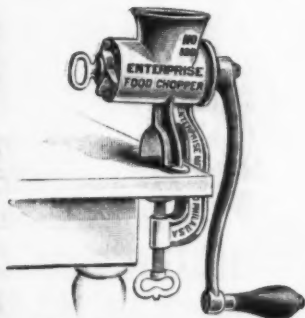
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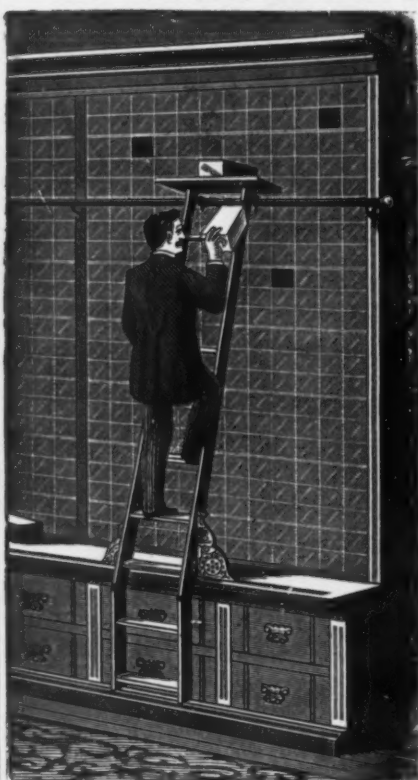
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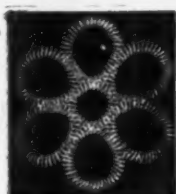
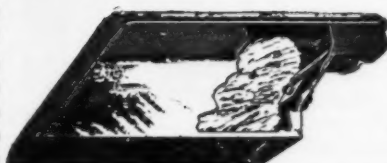
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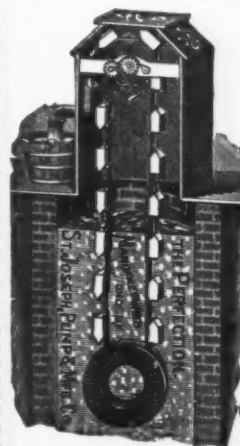


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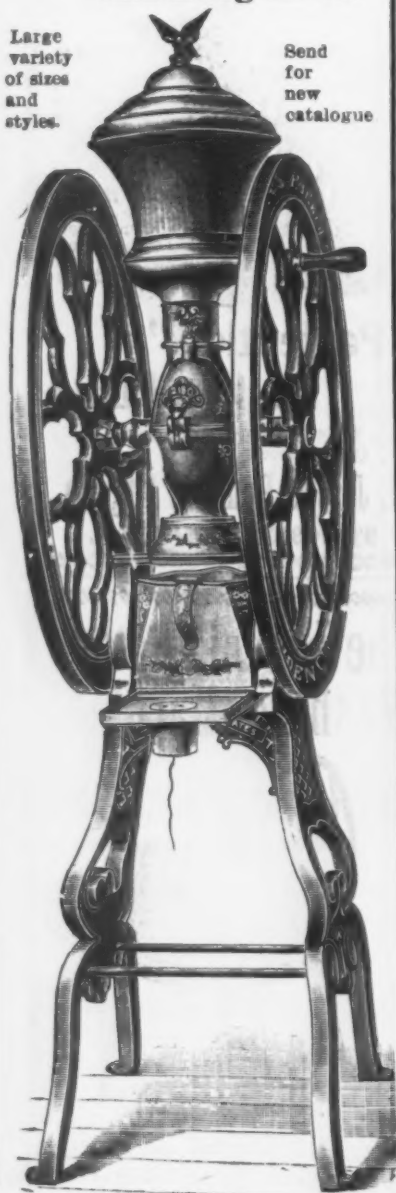
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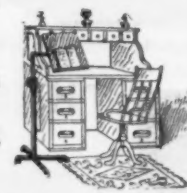
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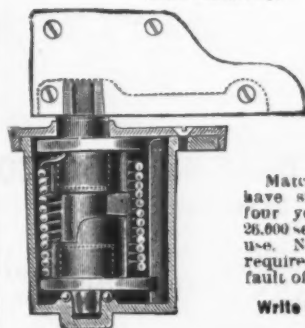
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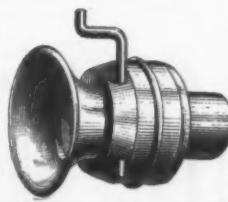
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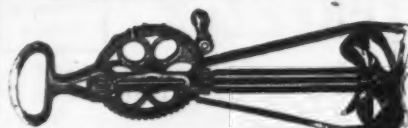
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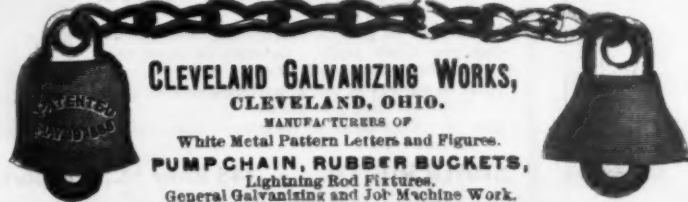
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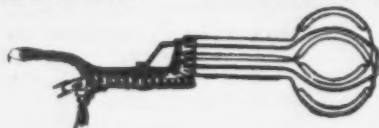


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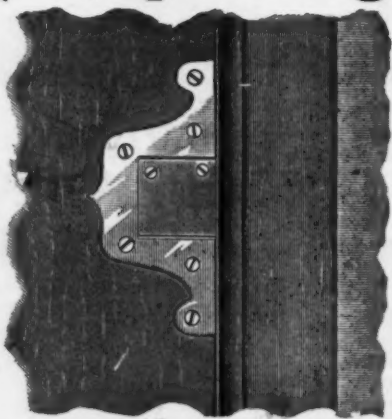
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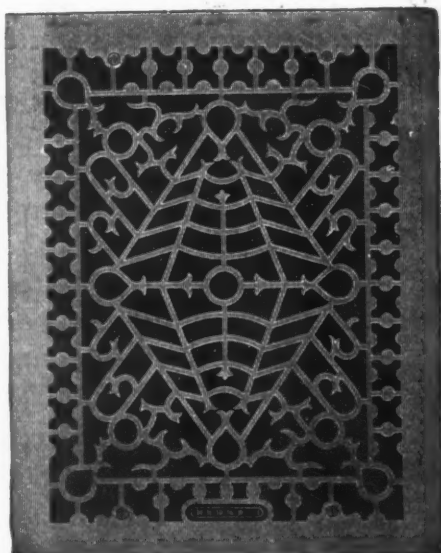
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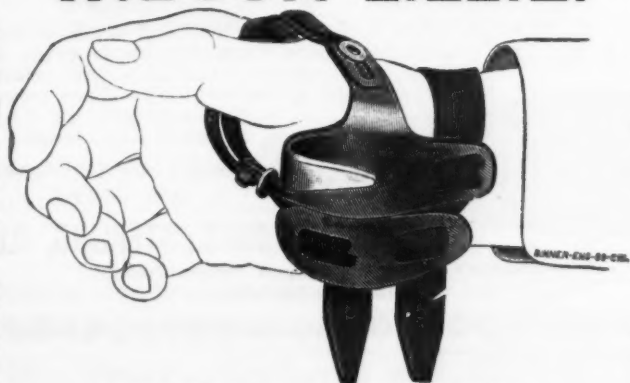
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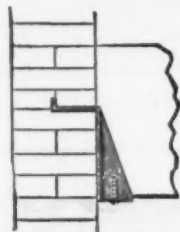
Mechanically perfect yet simple in construction.  $3\frac{1}{4}$  inch wheels.  
Track of double strength of others and reversible. Each door can be  
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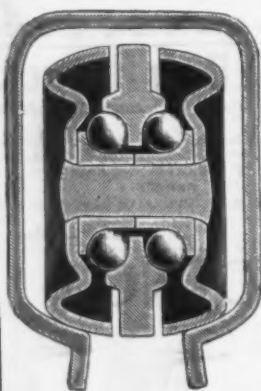
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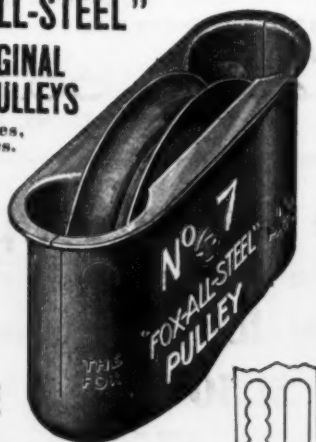
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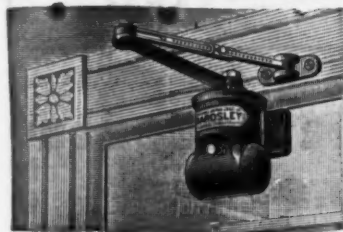
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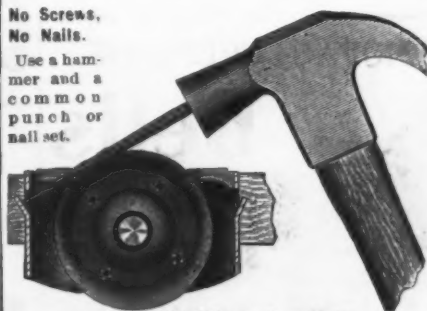
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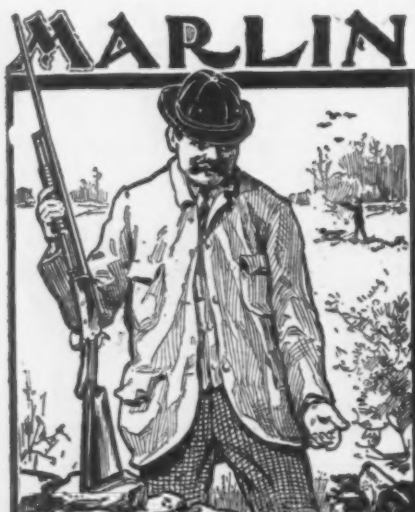
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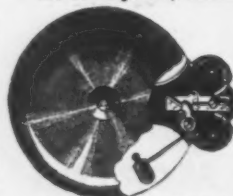
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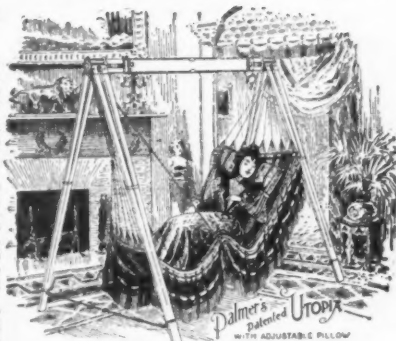
The Trapeze Suspension, as may be seen at a glance, is especially adapted to Veranda use, is adjustable to different sizes of Hammocks within its scope (from 6 ft. 3 in. to 11 ft.), and to giving different degrees of dip and heights of suspension. Every conceivable swinging motion is obtained without effort.

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The above Figure represents a reclining position in an Adjustable Hammock Support as used indoors. This support may be extended or contracted. The seat may be lowered or raised by the adjustment of the side cords where attached to the seat.

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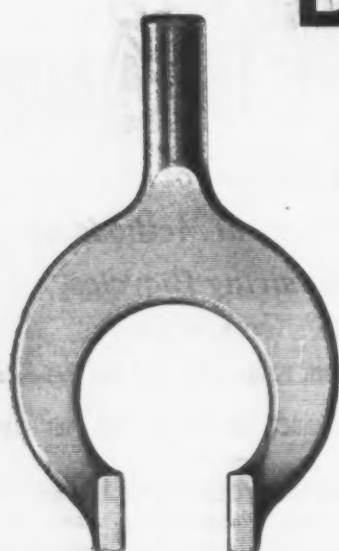
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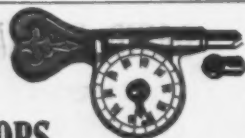
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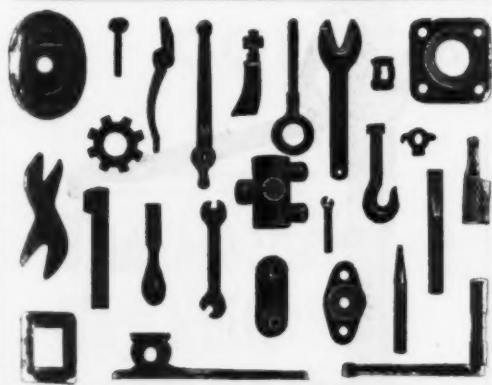
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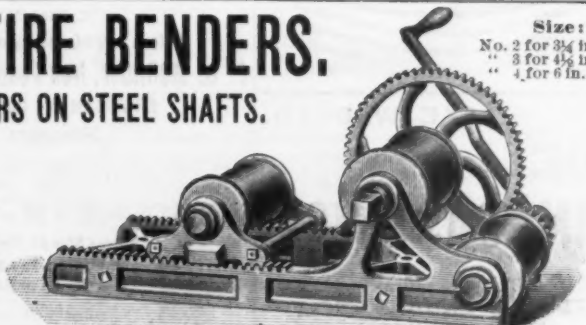
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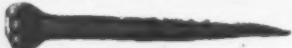
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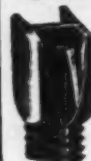


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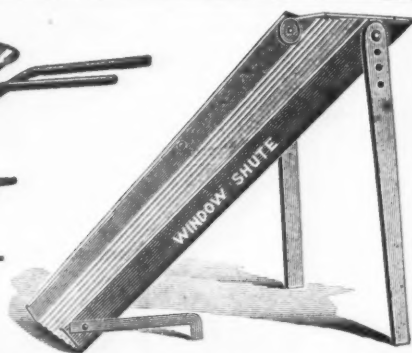
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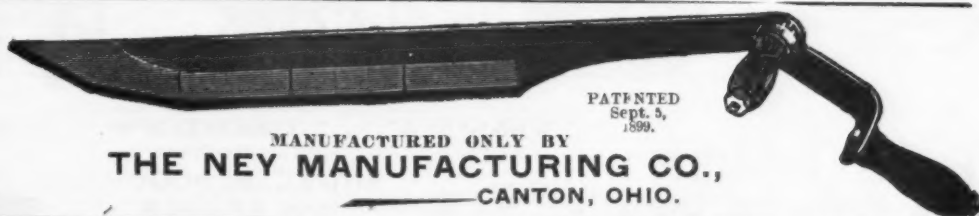
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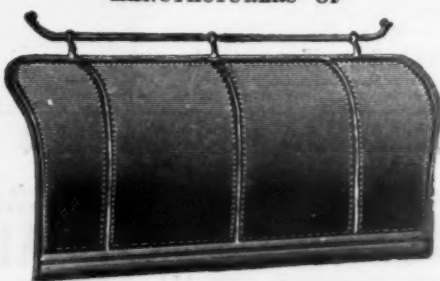
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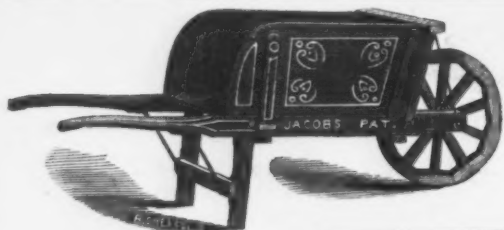


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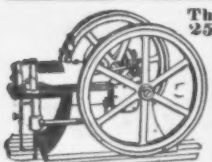
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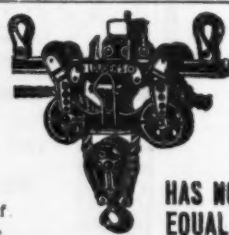
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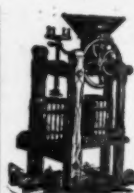
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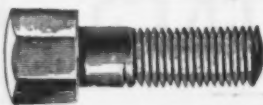


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Reeves, Paul S., Philadelphia, Pa.  
Shimer, H. M. & Co., Phila., Pa.  
Shonberger, I., 172 Hudson St., N. Y.  
Syracuse Smelting Wks., Syracuse, N. Y.

**Bale Ties**

Grissold Wire Co., Braddock, Pa.  
Kilmer Wire Mfg. Co., Chicago, Ill.  
Wilson, H. P. & H. F., 577 579 Tenth Ave., N. Y.

**Ball Floats**

Naugatuck Mfg. Co., Naugatuck, Conn.

**Bank and Office Railing**

Eveley Wire Works Co., 65 Fulton St., N. Y.

**Barb Wire and Fence**

Dillon-Grissold Wire Co., Sterling, Ill.

**Bar Iron**

Allentown Rolling Mill, Allentown, Pa.  
American Iron & Steel Mfg. Co., Lebanon, Pa.  
American Steel Hoop Co., Battery Park Building, N. Y.  
Barden Iron Co., Troy, N. Y.  
Cham Iron Iron & Steel Co., Muskegon, Mich.  
Consolidated Iron & Steel Co., Bristol, Pa.  
Lockhart Iron & Steel Co., Pittsburgh, Pa.  
Logan Iron & Steel Co., Burnham, Pa.  
National Steel Co., Bridgeport, O.  
Republic Iron & Steel Co., Chicago, Ill.  
Tennessee Coal, Iron & R. R. Co., Birmingham, Ala.  
Virginia Iron, Coal & Coke Co., Bristol, Va., Tenn.

**Bearings**

Hall Bearing Co., Boston, Mass.

**Beet Topping Knives**

Atkins, E. C. & Co., Indianapolis, Ind.

**Bellows**

Scott, Geo. M., Chicago, Ill.

**Bells and Gongs**

Bevin Bros. Mfg. Co., East Hampton, Ct.  
Gong Bell Mfg. Co., E. Hampton, Ct.  
Hill, N. N. Brass Co., E. Hampton, Ct.  
Mossberg, Frank Co., Attleboro, Mass.  
Starr Bros. Bell Co., Easthampton, Ct.

**Belt Dressing**

Dixon, Jos., Crucible Co., Jersey City, N. J.

**Belt Hooks**

Bristol Co., Waterbury, Conn.  
Talcott, W. O. Providence, R. I.

**Belt Studs**

Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.

**Belting**

Alexander Bros., 412 N. 3d, Phila., Pa.  
Ames Sword Co., Chicopee, Mass.  
Boston Belting Co., Boston, Mass.  
Machinery's Supply Co., Rochester, N. Y.  
Peelers Rubber Mfg. Co., 136-138 Warren St., New York.  
Shultz Belting Co., St. Louis, Mo.

**Belting, Chain**

Puhl Malleable Co., Detroit, Mich.  
Jeffrey Mfg. Columbus, O.  
Link-Belt Engineering Co., Phila., Pa.

**Bending Rolls**

Hilles & Jones Co., Wilmington, Del.  
New Doty Mfg. Co., Janesville, Wis.  
Niles Tool Works Co., 136-138 Liberty St., N. Y.

**Bicycle Bells—See Bells and Gongs.****Bicycle Chains**

Bridgeport Chain Co., Bridgeport, Ct.

**Bicycle Lamps**

Bridgeport Brass Co., Bridgeport, Conn.  
Plum & Atwood Mfg. Co., 29 Murray St., New York.

**Bicycle Machinery**

Bilas, E. W. Co., Brooklyn, N. Y.  
Draper Mch. Tool Co., Worcester, Mass.  
Garvin Mch. Co., Springfield and Varick Sts., New York.  
Pratt & Whitney Co., Hartford, Conn.

**Bicycle Parts**

Davis & Buxton Stamping Co., Worcester, Mass.  
Houghton & Buxton Mfg. Co., Worcester, Mass.  
Pittsburgh Screw & Bolt Co., Pittsburgh, Pa.  
Springfield Machine Screw Co., Springfield, Mass.  
Standard Tool Co., Cleveland, O.

**Bicycle Spokes**

Excelsior Needle Co., Torrington, Ct.

**Bicycle Sundries**

Bevin Bros. Mfg. Co., E. Hampton, Mass.  
Bridgeport Gun Implement Co., 313-315 Broadway, N. Y.  
Hill, N. N. Brass Co., E. Hampton, Ct.  
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.  
Smith & Edge Mfg. Co., Bridgeport, Ct.  
Supple-Hdw. Co., Phila., Pa.

**Bicycle Wrenches**

Springfield Drop Forging Co., Springfield, Mass.  
Star Mfg. Co., Carpentersville, Ill.

**Binder Twine**

American Mfg. Co., 65 Wall St., N. Y.

**Bird Cages**

Hendry, Andrew B. Co., New Haven, Conn.

**Bits**

Conn. Valley Mfg. Co., Centerbrook, Ct.  
Norton Mfg. Co., Chester, Conn.

**Bit Braces**

Mason & Parker, Winchendon, Mass.

**Black Plate**

American Tin Plate Co., N. Y.  
Champion Iron & Steel Co., Muskegon, Mich.

**Blast Forges**

Miner & Peck Mfg. Co., New Haven, Ct.

**Blocks, Tackle**

Boston & Lockport Block Co., Boston.  
Cleveland Block Co., Cleveland, O.  
Fulton Iron & Eng. Wks., Detroit, Mich.  
Lane Bros. Co., Poughkeepsie, N. Y.  
Union Hardware Co., Torrington, Ct.

**Blowers**

American Blower Co., Detroit, Mich.  
Asher, A., 109 Liberty St., N. Y.  
Bayley, Wm. & Sons Co., Milwaukee, Wis.  
Boston Blower Co., Hyde Park, Mass.  
Buffalo Forge Co., Buffalo, N. Y.  
Champion Blower & Forge Co., Lancaster, Pa.  
Cornell, J. B. & J. M., 26th and 11th Ave., New York City.  
Exeter Machine Wks., Boston, Mass.  
N. Y. Blower Co., Bucyrus, O.  
Santrevant, B. F. Co., Boston, Mass.  
Wilbraham Baker Blower Co., Phila., Pa.

**Boat Hardware**

Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.

**Boiler Makers' Machinery**

Prentice Bros., Worcester, Mass.

**Boiler Plates**

Lukens Iron & Steel Co., Coatesville, Pa.  
Seldel & Hastings Co., Wilmington, Del.

**Boiler Tubes**

Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.  
National Tube Co., Pittsburgh, Pa.

**Boilers, Steam**

Eabcock & Wilcox Co., 30 Cortlandt St.  
Caball Sales Dept., Pittsburgh, Pa.

**Harrison Safety Boiler Wks., Phila., Pa.**

Pollock, W. R. Co., Youngstown, O.  
Watson, E. P., Elizabeth, N. J.  
Wetherill, Robt. & Co., Chester, Pa.  
Wood, Jas. Mfg. Co., Conshohocken, Pa.

**Bolt Cutters**

Chambers Bros., Philadelphia, Pa.  
Helwig Mfg. Co., St. Paul, Minn.  
Porter, H. R., Boston, Mass.  
Sellers, Wm. & Co., Inc., Phila., Pa.

**Bolt and Nut Machinery**

Acme Machinery Co., Cleveland, Ohio.  
Ajax Mfg. Co., Cleveland, Ohio.  
Detrick & Harvey Mch. Co., Baltimore, Md.  
Howard Iron Works, Buffalo, N. Y.  
National Machinery Co., Tiffin, Ohio.

**Bolts**

American Iron & Steel Mfg. Co., Lebanon, Pa.  
American Screw Co., Providence, R. I.  
Blake & Johnson, Waterbury, Conn.  
Dunham Nut Co., Unionville, Conn.  
Franklin-Moore Co., Winsted, Conn.  
Hall's Sam'l Sons, 229 W. 10th St., N. Y.  
Haskell, Wm. H. Mfg. Co., Pawtucket, R. I.  
Laid, W. C., Bristol, Conn.  
National Elastic Nut Co., Milwaukee, Wis.  
Pittsburgh Screw & Bolt Co., Pittsburgh, Pa.  
Port Chester Bolt & Nut Co., Port Chester, N. Y.  
Rhode Island Tool Co., Providence, R. I.  
Rockford Bolt Works, Rockford, Ill.  
Shelton Co., Birmingham, Conn.

**Books**

Williams, David Company, 332-338 William Street, N. Y.

**Book Rests**

Allen, D. H. & Co., Miamisburg, O.

**Boring and Turning Mills**

Sellers, Wm. & Co., Inc., Phila., Pa.

**Boring Machines, Pneumatic**

Standard Pneumatic Tool Co., Chicago.

**Box Fixtures**

Cary Mfg. Co., 19-21 Roosevelt St., N. Y.

**Box Hasps and Hinges**

Cary Mfg. Co., 19-21 Roosevelt St., N. Y.

**Box Straps and Corners**

Cary Mfg. Co., 19-21 Roosevelt St., N. Y.

**Boxes, Hdw. Shelf, &c.**

Green, A. H. & Co., 22 Park Place, N. Y.  
Jones, Jesse, Paper Box Co., Phila., Pa.  
Moore, C. P., Ravenswood, W. Va.

**Braces**

Millers Falls Co., 38 Warren St., N. Y.

**Brackets, Shelf**

Atlas Mfg. Co., New Haven, Conn.  
Griffin Mfg. Co., Allegheny, Pa.  
Stovell Mfg. & Fdry Co., Chicago, Ill.

**Brass and Copper**

Ansonia Brass & Copper Co., 99 John St., N. Y.  
Bridgeport Brass Co., Bridgeport, Ct.  
Devol, John & Sons, 100 John, N. Y.  
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.  
Plum & Atwood Mfg. Co., 29 Murray St., N. Y.  
Randolph-Cloves Co., Waterbury, Conn.  
Rutter, A. T., 236 Broadway, N. Y.  
Seaville Mfg. Co., Waterbury, Conn.  
Shimer, H. M. & Co., Phila., Pa.  
Waterbury Brass Co., 60 Centre St., N. Y.

**Brass and Copper Rods**

Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.

**Brass and Copper Wire**

Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.

**Brass Butt Hinges**

Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.

**Brass Butts**

Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.

**Brass Founders**

Cramp, Wm. & Sons S. & E. B. Co., Philadelphia, Pa.  
Reeves, Paul S., Philadelphia, Pa.  
Ryan, J. J. & Co., Chicago, Ill.

**Brass Goods**

Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.

**Brass and Iron Jack Chains**

Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.

**Bread Knives**

Hartzell, Emmert, Fairfield, Pa.

**Bridge Builders**

American Bridge Co., East Berlin, Ct.  
Boston Bridge Works, Boston, Mass.  
Easter Bridge & Structural Co., Worcester, Mass.  
Illinois Steel Co., Chicago, Ill.  
New England Structural Co., Boston, Mass.  
Scaife, Wm. B. & Sons, Pittsburgh.

**Bronze Ingots**

Syracuse Smelting Wks., Syracuse, N. Y.

**Bronze, Manganese**

Cramp, Wm. & Sons S. & E. B. Co., Philadelphia, Pa.

**Bronze Tobin**

Ansonia Bronze & Copper Co., 99 John St., N. Y.

**Brooms and Brushes**

Osborn Mfg. Co., Cleveland, O.

**Buffing Wheels**

Divine Bros. Co., Utica, N. Y.

**Buggies**

Ferry Mfg. Co., Indianapolis, Ind.

**Builders' Hardware**

Norwalk Lock Co., So. Norwalk, Conn.  
Reading Hardware Co., Reading, Pa.  
Stanley Works, New Britain, Conn.  
U. S. Steel Lock Co., Clinton, Iowa.

**Bulldozers**

Williams, White & Co., Moline, Ill.

**Butchers' Saws**

Diaston, Henry & Sons, Inc., Phila., Pa.  
Goodell-Pratt Co., Greenfield, Mass.  
Jennings, C. E. & Co., 101 Reade St., N. Y.

**Butchers' Tools**

Chaffin, John & Sons, 35-39 Cliff St., N. Y.  
Goodell Co., Antrim, N. H.  
Hartzell, Emmert, Fairfield, Pa.

**Butts and Hinges—See Hinges.****Calibers and Dividers**

Starrett, L. S. Co., Athol, Mass.  
J. Stevens Arms & Tool Co., Chicopee Falls, Mass.

**Canon**

Snow, L. T., New Haven, Conn.

**Car Springs**

Scott, Chas. Spring Co., Phila., Pa.

**Carbide of Silicon**

Carborundum Co., Niagara Falls, N. Y.

**Carborundum Grains**

Carborundum Co., Niagara Falls, N. Y.

**Carborundum Wheels**

Carborundum Co., Niagara Falls, N. Y.

**Card Indexes**

Globe Wernicke Co., Cincinnati, O.

**Carriage Hardware**

Atlas Bolt & Screw Co., Cleveland, O.  
Baker, Jas. H. Mfg. Co., Pittsburgh, Pa.  
Clapp, E. D. Mfg. Co., Auburn, N. Y.  
Eccles, Richard, Auburn, N. Y.  
McKinnon Dash Co., Buffalo, N. Y.  
Scranton Forging Co., Scranton, Pa.

**Carriage and Wagon Springs**

Rowland, Wm. & Harvey, Phila., Pa.

**Cars**

Atlas Bolt & Screw Co., Cleveland, O.  
Sheffield Car Co., Three Rivers, Mich.

**Cartridges**

Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.  
Peters Cartridge Co., Cincinnati, O.  
Union Metallic Cartridge Co., 313-315 Broadway, N. Y.

**Carving Tools**

Buck, Chas., Millbury, Mass.

**Case Hardening Material**

American Carburizing Co., Jersey City



- New England Steel Castings Co., Philadelphia, Pa.  
Ola Steel Co., Ltd., Cleveland, Ohio  
Shaw, E. M., Providence, R. I.  
Union Steel Casting Co., Pittsburgh, Pa.
- Ceilings, Metal**  
Youngs own Iron & Steel Roofing Co., Youngstown, O.
- Cements, Iron**  
Smooth On Mfg. Co., Jersey City N. J.
- Chain**  
Bradlee & Co., Philadelphia.  
Bridgeport Chain Co., Bridgeport, Ct.  
Cullicott-Evans Chain Co., Allegheny, Pa.  
Garland Chain Co., Rankin, Pa.  
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.  
Jenkins Iron & Tool Co., Howard, Pa.  
Link-Belt Engineering Co., Phila., Pa.  
McKay Jas. & Co., Pittsburgh, Pa.  
Nicholson & Co., Pittsburgh, Pa.  
Onelida Community, Ltd., Niagara Falls  
Standard Chain Co., Pittsburgh, Pa.
- Chain Plants**  
Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.
- Chemicals**  
Kimer & Amend, New York.
- Cherry Stoners**  
Enterprise Mfg. Co., Philadelphia, Pa.  
Goodell Co., Antrim, N. H.
- Chisels**  
Buck Bros., Millbury, Mass.  
Buck, Chas., Millbury, Mass.  
Jennings, C. E. Co., 101 Reade St., N. Y.  
White, L. & J. Co., Buffalo, N. Y.
- Christmas Tree Holders**  
North Bros. Mfg. Co., Philadelphia, Pa.
- Chucks**  
Cushman Chuck Co., Hartford, Conn.  
Doebler Mfg. Co., Middletown, Conn.  
Goodell Pratt Co., Greenfield, Mass.  
Hogson & Pettis Mfg. Co., New Haven, Pa.  
Holland Mfg. Co., Erie, Pa.  
Horton, E. & Son Co., Windsor Locks, Ct.  
Ideal Machine Works, Hartford, Conn.  
Pratt Chuck Co., Frankfort, N. Y.  
Skinner Chuck Co., New Britain, Conn.  
Standard Tool Co., Cleveland, O.  
Union Mfg. Co., 108 Chambers, N. Y.  
Whitton, D. E. Mach. Co., New London, Conn.
- Cider Mills**  
Whitehurst, R. W. & Co., Norfolk, Va.
- Circular Sawing Machines**  
Kidder, R. E., Worcester, Mass.
- Clamps**  
Bealey, C. H. & Co., Chicago, Ill.  
Hall, Thos., Brooklyn, N. Y.  
Hammer & Co., Branford, Conn.
- Clipping Machines**  
Amer. Shearer Mfg. Co., Nashua, N. H.  
Chicago Flexible Shaft Co., Chicago, Ill.  
McCoy, Jos. F. Co., 35 Warren St., N. Y.  
Wiebusch & Hilger, Ltd., 9-15 Murray St., N. Y.
- Clothes Dryers**  
Bill Dryer Co., Worcester, Mass.
- Clothes Line Hook**  
Wilson, E. H. & Co., Allston, Mass.
- Clothes Pins**  
U. S. Clothes Pin Co., Montpelier, Vt.
- Coal**  
Alabama Consolidated Coal & Iron Co., Birmingham, Ala.  
Eloes Sheffield Steel & Iron Co., Birmingham, Ala.  
Washington Coal & Coke Co., Dawson, Pa.  
Wister, Francis, Philadelphia, Pa.
- Coal Cars**  
Lansing Wheelbarrow Co., Lansing, Mich.
- Coal Picks**  
Jenkins Iron & Tool Co., Howard, Pa.
- Coal Shutes**  
Lansing Wheelbarrow Co., Lansing, Mich.
- Coffee and Spice Mills**  
Arcade Mfg. Co., Freeport, Ill.  
Parker, Chas. Co., Meriden, Conn.
- Coke**  
Alabama Consolidated Coal & Iron Co., Birmingham, Ala.  
Bessemer Coke Co., Pittsburgh, Pa.  
Cherry Valley Iron Co., Pittsburgh, Pa.  
Dimmick, J. K. & Co., Phila., Pa.  
Frick, H. C. Coke Co., Pittsburgh, Pa.  
Houston, C. B. & Co., Philadelphia, Pa.  
Sloss Sheffield Steel & Iron Co., Birmingham, Ala.  
Tennessee Coal, Iron & R. R. Co., Birmingham, Ala.  
Virginia Iron, Coal & Coke Co., Bristol, Va., Tenn.  
Washington Coal & Coke Co., Dawson, Pa.  
Wister, Francis, Philadelphia, Pa.
- Compressed Air Machinery**  
Phila. Pneumatic Tool Co., Phila., Pa.
- Conductor Pipe**  
Berger Bros. Co., Philadelphia, Pa.
- Conveying Machinery**  
Aultman Co., Canton, Ohio.  
Brown Hoisting & Conveying Machine Co., Cleveland, Ohio.  
California Wire Works, San Francisco, Du Bois Iron Works, Du Bois, Pa.  
Hunt, C. W. Co., New Brighton, N. Y.  
Jeffrey Mfg. Co., Columbus, O.  
Link-Belt Engineering Co., Phila., Pa.
- Cooking Utensils**  
Cleveland Stamping & Tool Co., Cleveland, O.
- Coping Saw**  
Jones & Dummerman, Chicago, Ill.
- Copper**  
Hendricks Bros., 49 Cliff, N. Y.  
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.  
United Metals Selling Co., 11 Broadway, N. Y.
- Copper Hammers**  
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.
- Copper Rivets and Burrs**  
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.
- Copper Tacks and Nails**  
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.
- Cordage**  
Macomber & Whyte Rope Co., Chicago  
Samson Cordage Works, Boston, Mass.  
Silver Lake Co., Boston, Mass.
- Core Ovens**  
Millet Core Oven Co., Brightwood, Mass.
- Cork Screws and Cork Pullers**  
Erie Specialty Co., Erie, Pa.
- Corn Hooks**  
Wilmington & Cooley Mfg. Co., Jackson, Mich.
- Corn Huskers**  
Wilcox Mfg. Co., Aurora, Ill.
- Corrugated Iron and Steel**  
Garry Iron & Steel Roofing Co., Cleveland, O.  
McCullough Iron Co., Wilmington, Del.  
Scaife, Wm. B. & Sons, Pittsburgh.
- Cotter Pin Machines, Automatic**  
Shuster, F. B. Co., New Haven, Conn.
- Cotton Ties**  
American Steel Hoop Co., Battery Park Building, N. Y.
- Counting Machines**  
Durant, W. N. Milwaukee, Wis.
- Couplings, Compression**  
Fennett, Geo. B. Co., Youngstown, O.
- Cow Ties**  
Garland Chain Co., Rankin, Pa.  
Onelida Community, Ltd., Niagara Falls, Pa.
- Cranes**  
Brown Hoisting & Conveying Mch. Co., Cleveland, O.  
Chisholm & Moore Mfg. Co., Cleveland, Cleveland Crane & Car Co., Cleveland, O.  
Niles Tool Works Co., 135-138 Liberty St., N. Y.  
Northern Engineering Works, Detroit, Mich.  
Pawling & Harnischfeger, Milwaukee, Wis.  
Pneumatic Crane Co., Pittsburgh, Pa.  
Reading Crane & Hoist Wks., Reading, Pa.  
Ridgway, Craig & Son Co., Coatesville, Pa.  
Spedel, J. G., Reading, Pa.
- Crayon**  
Steward, D. M. Mfg. Co., Chattanooga, Tenn.
- Crucibles**  
Dixon, Jos. Crucible Co., Jersey City, N. J.
- Cupolas**  
Paxson, J. W. Co., Philadelphia, Pa.
- Cupolas, Hot Blast**  
Byram & Co., Detroit, Mich.
- Curry Combs**  
New York Stamping Co., Brooklyn, N. Y.
- Cutlery**  
Chas. Augustus Cutlery Co., Little Valley, N. Y.  
Chatillon, John & Sons, 35 to 39 Cliff St., N. Y.  
Dame, Stoddard & Co., Boston.  
Goodell Co., Antrim, N. H.  
Kimball, C. J. Co., Bennington, N. H.  
Smith & Hemenway Co., 236 Broadway, N. Y.  
Southington Cutlery Co., Southington, Conn.  
Wiebusch & Hilger, Ltd., 9 to 15 Murray St., N. Y.
- Cutting Off Machines**  
Hurlbut Rogers Mach. Co., So. Sudbury, Mass.
- Cylinders, Air and Gas**  
Harrisburg Pipe Bending Co., Harrisburg, Pa.
- Dampers**  
Lodge & Strobbridge Iron Co., New Brighton, Pa.  
Stover Mfg. Co., Freeport, Ill.  
Williams, A. C., Ravenna, O.
- Dashes and Fenders**  
McKinnon Dash Co., Buffalo, N. Y.
- Diamond Tools**  
Dickinson, Thos. L., 45 Vesey St., N. Y.
- Dies**  
Adrian Mach. Works, Brooklyn, N. Y.  
American Hdw. Mfg. Co., Ottawa, Ill.  
Hilas, E. W. Co., Brooklyn, N. Y.  
Ferracute Mach. Co., Bridgeton, N. J.  
Hay-Budden Mfg. Co., Brooklyn, N. Y.  
Mossberg, Frank Co., Attleboro, Mass.  
Richard Mfg. Co., Bloomburg, Pa.  
Wilson & Smith, Worcester, Mass.
- Dog Collars**  
Union Hardware Co., Torrington, Ct.
- Door Bells—See Bells and Gongs.**
- Door Checks and Springs**  
Bardsley, Jos., 147 151 Baxter St., N. Y.  
Larimer Mfg. Co., Pittsburgh, Pa.  
Fullman Sash Balance Co., Rochester, N. Y.
- Door Holders**  
Caldwell Mfg. Co., Rochester, N. Y.
- Dragnet Springs**  
Burditt & Williams, Boston, Mass.
- Draw Benches**  
Richard Mfg. Co., Bloomsburg, Pa.  
Thompson, Hugh L., Waterbury, Ct.
- Drawing Stands**  
Allen, D. H. & Co., Miamisburg, O.
- Drill Grinders**  
Heald, L. S. & Son, Barre, Mass.  
Sellers, Wm. & Co., Inc., Phila., Pa.  
Washburn Shops of Worcester Polytechnic Inst., Worcester, Mass.  
Wilmuth & Sorman, Grand Rapids, Mich.
- Drilling Machines**  
Baker Bros., Toledo, O.  
Barnes, R. F. Co., Rockford, Ill.  
Barnes, W. F. & John Co., Rockford, Ill.  
Baush Mch. Tool Co., Springfield, Mass.  
Bement, Miles & Co., Phila., Pa.  
Bickford Drill & Tool Co., Cin., Ohio.  
Bullard Machine Tool Co., Bridgeport, Ct.  
Burnham, Geo. Co., Worcester, Mass.  
Champion Blower & Forge Co., Lancaster, Pa.  
Cincinnati Mch. Tool Co., Cincinnati, O.  
Dallitt, Thos. H. & Co., Philadelphia.  
D'Amour & Littledale Mch. Co., 121 Worth St., N. Y.  
Davis, W. F., Machine Co., Rochester, N. Y.  
Detrick & Harvey Mch. Co., Baltimore, Md.
- Fordick & Holloway Mach. Tool Co.,**  
Incinnati, O.  
Harrington, E. Son & Co., Phila., Pa.  
Hill, Clarke & Co., Boston, Mass.  
Hofer Mfg. Co., Freeport, Ill.  
Frederic Bros., Worcester, Mass.  
Quint, A. D., Hartford, Conn.  
Shuster, F. B. Co., New Haven, Conn.  
Sibley & Ware, So. Bend, Ind.  
Sigourney Tool Co., Hartford, Conn.  
Smyth Mfg. Co., Salem, O.  
Slate Dwight Machine Co., Hartford, Ct.  
Stow Flexible Shaft Co., Phila., Pa.  
Wiley & Russell Mfg. Co., Greenfield, Mass.  
Woodward & Rogers, Hartford, Conn.  
York, S. M. Co., Cleveland, O.
- Drilling Machines, Automatic**  
Gould & Eberhardt, Newark, N. J.
- Drive Chalus**  
Locke Steel Belt Co., Bridgeport, Conn.
- Drop Forgings**  
Belden Machine Co., New Haven, Conn.  
Billings & Spencer Co., Hartford, Conn.  
Chicago Drop Forging & Fdry. Co., Kensington, Ill.  
Clapp, E. D. Mfg. Co., Auburn, N. Y.  
Consolidated Railway Electric Lighting & Equipment Co., 100 Broadway, N. Y.  
Eccles, Richard, Auburn, N. Y.  
Indianapolis Drop Forging Co., Indianapolis, Ind.  
Keystone Drop Forge Co., Philadelphia, Pa.  
Kilborn & Bishop Co., New Haven, Conn.  
R. I. Tool Co., Providence, R. I.  
Scranton Forging Co., Scranton, Pa.  
Seward, M. & Son Co., New Haven, Ct.  
Springfield Drop Forging Co., Springfield, Mass.  
Strieby & Foote Co., Newark, N. J.  
Transue & Williams Co., Alliance, O.  
Williams, J. H. & Co., Brooklyn, N. Y.  
Wyman & Gordon, Worcester, Mass.
- Drop Hammers**  
Billings & Spencer Co., Hartford, Conn.  
Williams, White & Co., Moline, Ill.
- Drop Presses**  
Manville, E. J. Mch. Co., Waterbury, Ct.  
Miner & Peck Mfg. Co., New Haven, Ct.  
Mossberg & Granville Mfg. Co., Providence, R. I.  
Vulcan Iron Works, Chicago, Ill.
- Dumb Waiters**  
Energie Elevator Co., Philadelphia, Pa.  
Spedel, J. G., Reading, Pa.  
Storm Mfg. Co., Brooklyn, N. Y.  
Variety Machine Co., Warsaw, N. Y.
- Dump Cars**  
Atlas Bolt & Screw Co., Cleveland, O.
- Dynamoes**  
Eddy Electric Mfg. Co., Windsor, Conn.  
General Electric Co., Schenectady, N. Y.  
Hanson & Van Winkle Co., Newark, N. J.  
Stewart Electrical Co., Cincinnati, O.  
Westinghouse Elec. & Mfg. Co., Pittsburgh, Pa.  
Zucker & Levett & Loeb Co., 535-539 W. 25th St., New York.
- Eave Trough Hangers**  
Berger Bros. Co., Philadelphia, Pa.  
Heartley Mach. ne Variety Iron & Tool Works, Toledo, O.  
Oatman Bros., Medina, O.
- Edge Tools**  
Buck, Chas., Millbury, Mass.  
Buck Bros., Millbury, Mass.  
Ferro-Carbon Castings Co., Phila., Pa.  
White, L. & J. Co., Buffalo, N. Y.
- Egg Beaters**  
Lyons, Nelson, Albany, N. Y.  
Standard Co., Boston, Mass.  
Taplin Mfg. Co., Forestville, Conn.
- Egg Opener**  
Hartigan, W. R., Collinsville, Ct.
- Electric Bells and Supplies**  
Ostrander, W. R. & Co., 314 Fulton St.
- Electric Controllers**  
Electric Controller & Supply Co., Cleveland, O.
- Electric Lighting and Power Apparatus**  
Eddy Electric Mfg. Co., Windsor, Conn.  
General Electric Co., Schenectady, N. Y.
- Electrical Apparatus**  
Westinghouse Elec. & Mfg. Co., Pittsburgh, Pa.
- Electrical Machinery**  
Stewart Electrical Co., Cincinnati, O.
- Electrotypes**  
St. Louis Electrotypes Foundry, St. Louis, Mo.
- Elevators, Makers of**  
Eastern Machinery Co., New Haven, Ct.  
Energy Elevator Co., Philadelphia, Pa.  
Link-Belt Engineering Co., Phila., Pa.  
Morse, Williams & Co., Phila., Pa.  
Ridgway, Craig & Son Co., Coatesville, Pa.  
Spedel, J. G., Reading, Pa.  
Variety Machine Co., Warsaw, N. Y.  
Warner Elevator Mfg. Co., Cincinnati, O.
- Elevator Buckets**  
Clark, W. J. & Co., Salem, O.  
Cleveland Elevator Bucket Co., Cleveland, O.
- Elevator Enclosures and Cabs**  
Ludlow Saylor Wire Co., St. Louis, Mo.
- Emery**  
Tanite Co., Stroudsburg, Pa.
- Emery Wheels**  
American Emery Wheel Works, Providence, R. I.  
Best, L., 45 Vesey St., N. Y.  
Bridgeport Safety Emery Wheel Co., Bridgeport, Conn.  
Buffalo Emery Wheel Co., Buffalo, N. Y.  
Diamond Mach. Co., Providence, R. I.  
Nazel, John, Phila., Pa.  
Northampton Emery Wheel Co., Leeds, Mass.  
Norton Emery Wheel Co., Worcester, Mass.  
Safety Emery Wheel Co., Springfield, O.  
Springfield Mfg. Co., Bridgeport, Conn.  
Sterling Emery Wheel Co., Tiffin, O.  
Tanite Co., Stroudsburg, Pa.
- Vitrified Emery Wheel Co., Westfield, Mass.**
- Emery Wheel Dresser**  
Chicago Screw Co., Chicago, Ill.  
Dickinson, Thos. L., 45 Vesey St., N. Y.
- Engineers and Contractors**  
Aiken, Henry, Pittsburgh, Pa.  
Erikson, Edw. E., Pittsburgh, Pa.  
Filer & Stowell Co., Milwaukee, Wis.  
Forster-Miller Engineering Co., Pittsburgh, Pa.  
Hevi & Patterson, Pittsburgh, Pa.  
Huber, S. V. Co., Pittsburgh, Pa.  
Ray, G. Ashton, 233 Broadway, N. Y.  
Kennedy, Julian, Pittsburgh, Pa.  
Kennedy, Walter, Pittsburgh, Pa.  
Lamond, David, Pittsburgh, Pa.  
Laughlin, Alex. & Co., Pittsburgh, Pa.  
McClure, G. W. Son & Co., Pittsburgh, Pa.  
Morgan Construction Co., Worcester, Mass.  
Penna. Engineering Wks., New Castle, Penna.  
Ritter-Conley Mfg. Co., Pittsburgh, Pa.  
Smythe, S. E. Co., Inc., Pittsburgh, Pa.  
Swindell, W. & Bros., Pittsburgh, Pa.  
Thompson, Hugh L., Waterbury, Ct.  
Wellman-Seaver Engineering Co., Cleveland, O.
- Engines**  
*Gas*  
Mietz, Aug., 128-129 Mott St., N. Y.  
Northern Engineering Works, Detroit, Mich.  
Ruger, J. W. Mfg. Co., Buffalo, N. Y.  
Woolley Fdry. & Mch. Works, Anderson, Ind.  
*Gasoline*  
Charter Gas Engine Co., Sterling, Ill.  
Ruger, J. W. Mfg. Co., Buffalo, N. Y.  
Weber Gas & Gasoline Engine Co., Kansas City, Mo.  
Watkins, F. M., Cincinnati, O.  
Woolley Fdry. & Mch. Works, Anderson, Ind.  
*Kerosene*  
Mietz, Aug., 128-129 Mott St., N. Y.  
*Steam*  
Allis, E. P. Co., Milwaukee, Wis.  
Boston Blower Co., Hyde Park, Mass.  
Buffalo Forge Co., Buffalo, N. Y.  
Filer & Stowell Co., Milwaukee, Wis.  
Newport News Shipbuilding & Dry Dock Co., 1 Broadway, N. Y.  
Sennett Geo. B. Co., Youngstown, O.  
Southwick Fdry. & Mch. Co., Philadelphia, Pa.  
Sturtevant, B. F. Co., Boston, Mass.  
Tod, William & Co., Youngstown, O.  
Totten & Hogg Iron & Steel Fdry. Co., Pittsburgh, Pa.  
Wetherill, Robt. & Co., Chester, Pa.
- Engines, Marine**  
Lake City Engineering Co., Erie, Pa.
- Engines, Second Hand**  
Everson, B. M., Pittsburgh, Pa.
- Engravers**  
Muzford A., Hartford, Conn.
- Expanding Mandrels**  
LeCount, Wm. G., So. Norwalk, Conn.
- Expansion Bolts**  
Church, Isaac Toledo, O.  
McCabe Hanger Mfg. Co., 333-343 W. 22d St., N. Y.  
Newhall Henry B. Co., N. Y.  
Seaman D. C. & Co., Philadelphia, Pa.  
Steward & Komaine Mfg. Co., Phila., Pa.
- Farmers' Tools**  
Champion Tool Co., Ltd., Conneaut Lake, Pa.  
Heiler Bros. & Co., Newark, N. J.
- Faucets**  
Litchfield, J. M., 105 Beekman St., N. Y.  
McKenna Bros., Brass Co., Ltd., Pittsburgh, Pa.
- Faucets, Wooden**  
Boston & Lockport Block Co., Boston.  
Sommer's, John, Son, Newark, N. J.
- Feed Cutters**  
Silver Mfg. Co., Salem, O.
- Feed Water Heaters and Purifiers**  
Harrisburg Pipe Bending Co., Harrisburg, Pa.  
Harrison Safety Boiler Works, Philadelphia, Pa.  
Kelly, B. F. & Son, 91 Liberty St., N. Y.  
National Pipe Bending Co., New Haven.  
Patterson, F. L., 136 Liberty St., N. Y.  
Taunton Locomotive Mfg. Co., Taunton, Mass.  
Webster, Warren & Co., Camden, N. J.  
Whitlock Coal Pipe Co., Hartford, Ct.
- Fencing, Iron and Wire**  
Adam, W. J., Joliet, Ill.  
American Steel & Wire Co., Chicago, Ill.  
Barnum, E. T., Detroit, Mich.  
Clinton Wire Cloth Co., Clinton, Mass.  
DeKalb Fence Co., DeKalb, Ill.  
Dwiggins Wire Fence Co., Anderson, Ind.  
Ellis & Halfenbarger, Indianapolis, Ind.  
Frost Wire Fence Co., Cleveland, O.  
Gilbert & Bennett Mfg. Co., 42 Cliff St.  
Hartman Mfg. Co., 300 Broadway, N. Y.  
Kilmer Wire Mfg. Co., Chicago, Ill.  
Kokomo Fence Mch. Co., Kokomo, Ind.  
Ludlow Saylor Wire Co., St. Louis, Mo.  
Ornamental Iron & Wire Co., Chattanooga, Tenn.  
Rossman Woven Wire Fence Co., Rossman, N. Y.  
Stewart Iron Works, Cincinnati, Ohio.  
Up-to-date Mfg. Co., Terre Haute, Ind.
- Ferro-Chromium**  
Willson Aluminum Co., 99 Cedar Street, N. Y.
- Files and Rasps**  
*Manufacturers of*  
Arcade File Works, Anderson, Ind.  
Barnett, G. & H. Co., 41 & 43 Richmond Phila.  
Diston, Henry & Sons, Inc., Phila., Pa.  
Heiler Bros. Co., Newark, N. J.  
McCaffrey File Co., Philadelphia.  
Nicholson File Co., Providence, R. I.  
Stokes Bros. Mfg. Co., Freehold, N. J.
- Filing Cabinets**  
Globe-Wernicke Co., Cincinnati, O.
- Filters**  
Scaife, Wm. B. & Sons, Pittsburgh, Pa.

**Finished Castings**  
Franklin, H. H. Mfg. Co., Syracuse.

**Fire Brick**  
Borgner, Cyrus, Philadelphia, Pa.  
Gardner Bros., Cumberland, Md.  
Hawes, W. H. Fire Brick Co., Mt. Union.  
Maurer, H. & Son, 42 E. 23d, N. Y.  
Ostrander Fire Brick Co., Troy, N. Y.  
Polnier & Lester, Toledo, O.  
Presbrey Fire Brick Co., Taunton, Mass.  
Staten Island Clay Co., Woodbridge,  
Taylor's, Chas. Sons Co., Cincinnati.  
Valentine, M. D. & Bro. Co., Woodbridge.

**Fishing Tackle**  
Dane, Stoddard & Co., Boston, Mass.

**Flexible Shafting**  
Chicago Flexible Shaft Co., Chicago, Ill.  
Saw Flexible Shaft Co., Phila., Pa.  
Stow Mfg. Co., Birmingham, N. Y.

**Flint and Emery Paper**  
Bader, Adamson & Co., Phila., Pa.

**Floor and Ceiling Plates**  
Coddling Mfg. Co., Bristol, Conn.

**Floor Hinge**  
Lawson Mfg. Co., Milwaukee, Wis.

**Flue Cleaners**  
Jackson Flue Scraper Co., Jackson.  
Jarecki Mfg. Co., Erie, Pa.

**Fly Killers**  
Higelow, J. F., Worcester, Mass.  
Montgomery, R. B. & Co., Decatur, Ill.

**Fly Traps**  
Meyers, Fred. J. Mfg. Co., Hamilton, O.

**Foot Power Emery Wheels**  
Buffalo Emery Wheel Co., Buffalo, N. Y.

**Foot Rests**  
Star Heel Plate Co., Newark, N. J.

**Forges, Portable, &c.**  
Bradley Co., Syracuse, N. Y.  
Champion Blower & Forge Co., Lancaster, Pa.  
Fairbanks Co., 311 Broadway, N. Y.  
Sturtevant, B. F. Co., Boston, Mass.

**Forgings, Iron and Steel**  
Baker, Jas. H. Mfg. Co., Pittsburgh, Pa.  
Bethlehem Steel Co., S. Bethlehem, Pa.  
Eastern Forge Co., Boston, Mass.  
Frankford Steel Co., Phila., Pa.  
Hay-Budden Mfg. Co., Brooklyn, N. Y.  
Otis Steel Co., Ltd., Cleveland, Ohio.  
Titusville Forge Co., Titusville, Pa.  
U. S. Projectile Co., Brooklyn, N. Y.  
Vulcanus Forging Co., Cleveland, O.

**Forks, Hay and Manure**  
Continental Tool Co., Frankfort, N. Y.  
Iowa Farming Tool Co., Ft. Madison, Ia.  
Withington & Cooley Mfg. Co., Jackson.

**Foundry Facings**  
Obermayer, S. Co., Cincinnati, O.

**Foundry Lamps**  
Forest City Mfg. Co., Cleveland.  
Paxson, J. W. Co., Phila., Pa.

**Foundry Supplies**  
Gilmour, J., Bennett Building, N. Y.  
Obermayer, S. Co., Cincinnati, Ohio.  
Osborn Mfg. Co., Cleveland, O.  
Paxson, J. W. Co., Phila., Pa.  
Polnier & Lester, Toledo, O.

**Four-Head Milling Machines**  
Ingersoll Milling Machine Co., Rockford, Ill.

**Friction Clutches**  
Eastern Machinery Co., New Haven, Ct.  
Hess, Snyder & Co., Massillon, O.

**Furnaces, Foundry**  
Byram & Co., Detroit, Mich.

**Furnaces, Oil, Gas and Coal**  
Rockwell Engineering Co., 36 Cortlandt St., N. Y.

**Fuses**  
Ensign Bickford & Co., Simsbury, Ct.

**Gages**  
Crosby Steam Gage & Valve Co., Boston.

**Galvanized Ware**  
Keen & Hagerty Mfg. Co., Baltimore.

**Galvanizing**  
Blackman & King, 801 Greenwich St., N. Y.  
Cleveland Galvanizing Works, Cleveland, O.  
Empire Pipe Bending & Supply Co., Brooklyn, N. Y.

**Galvanizing Process**  
U. S. Electro Galvanizing Co., 348 Broadway, N. Y.

**Garden Rakes**  
Jenkins Iron & Tool Co., Howard, Pa.

**Garden Tools**  
Withington & Cooley Mfg. Co., Jackson.

**Gas Compositometer**  
Uehling, Steinbart & Co., Ltd. Carlstadt, N. J.

**Gas Compressors**  
Norwalk Iron Works Co., So. Norwalk.

**Gas Furnaces**  
Am. Gas Furnace Co., 33 John St., N. Y.  
Chicago Flexible Shaft Co., Chicago, Ill.

**Gaskets**  
Canfield, H. O., Bridgeport, Conn.

**Gaskets, Copper**  
Drake Acetylene Apparatus Co., Cleveland, O.

**Gaskets, Iron**  
Smooth On Mfg. Co., Jersey City, N. J.

**Gas Producers**  
Duff Patent Co., Allegheny, Pa.  
Smythe, S. R. Co., Inc., Pittsburgh, Pa.  
Swindell, W. & Bro., Pittsburgh, Pa.

**Gauges, Rolling Mill**  
Haines Gauge Co., Philadelphia, Pa.

**Gears**  
Boston Gear Works, Boston, Mass.  
Gleason Tool Co., Rochester, N. Y.  
Morse, Williams & Co., Phila., Pa.  
Nuttall, R. D. Co., Pittsburgh, Pa.  
Poole, Robt. Son & Co., Baltimore, Md.

**Gears, Rawhide**  
Horsburgh & Scott, Cleveland, Ohio.

**Gear Cutters**  
Becker Brainard Milling Machine Co., Hyde Park, Mass.  
Gould & Eberhardt, Newark, N. J.  
Whitton, D. E. Mch. Co., New London, Conn.

**Generators, Electric**  
W. Stingham Elec. & Mfg. Co., Pittsburgh, Pa.

**Gimlets**  
No. 10 Mfg. Co., Chester, Conn.

**Glass Cutters**  
Barrett, W. L., Bristol, Conn.  
Bulman, F. H. & Co., Cleveland, O.  
Monce, S. G., Unionville, Conn.  
Smith & Hemenway Co., 296 Broadway, N. Y.

**Glass Cutting Boards**  
Larkin Rule Co., Saginaw, Mich.

**Glue**  
Bader, Adamson & Co., Phila., Pa.

**Golf Goods**  
Bridgeport Gun Implement Co., 312 Broadway, N. Y.

**Grain Drill Tubes**  
Hart, R. R., Greenwich, O.

**Grates, Rocking**  
Sennett, Geo. E. Co., Youngstown, O.

**Grease, Axle**  
Snow Flake Axle Grease Co., Boston.

**Grinding and Polishing Mchs.**  
American Emery Wheel Works, Providence, R. I.  
Barnes, W. F. & John Co., Rockford, Ill.  
Besly, Chas. H. & Co., Chicago, Ill.  
Brown & Sharpe Mfg. Co., Providence.  
Cincinnati Milling Mach. Co., Cincinnati, O.  
Diamond Mach. Co., Providence, R. I.  
Lands Tool Co., Waynesboro, Pa.  
Northampton Emery Wheel Co., Leeds, Mass.  
Norton Emery Wheel Co., Worcester, Mass.  
Safety Emery Wheel Co., Springfield, O.  
Springfield Mfg. Co., Bridgeport, Conn.  
Tanite Co., Stroudsburg, Pa.  
Universal Mach. Co., Providence, R. I.  
Wilmarth & Morman, Grand Rapids.

**Grindstones**  
Cleveland Stone Co., Cleveland, O.

**Grubbing Machine**  
New Century Mfg. Co., 43 E. 8th St., N. Y.

**Guns**  
Harrington & Richardson Arms Co., Worcester, Mass.  
Johnson, Iver Arms & Cycle Works, Fitchburg, Mass.  
Marlin Fire Arms Co., New Haven, Ct.  
Remington Arms Co., 315 Broadway, New York.

**Gun Implements**  
Union Hardware Co., Torrington, Conn.

**Gymnasium Apparatus**  
Narasansett Mch. Co., Providence, R. I.

**Hack Saws**  
Disston, Henry & Sons, Inc., Phila., Pa.  
Goodell-Pratt Co., Greenfield, Mass.  
Springfield Machine Screw Co., Springfield, Mass.  
Starrett, L. S. Co., Athol, Mass.

**Hammer Mold**  
Field, C. H., Providence, R. I.

**Hammers**  
Heller Bros. Co., Newark, N. J.  
Logan & Strobbridge Iron Co., New Brighton, Pa.

**Hammers, Pneumatic**  
Standard Pneumatic Tool Co., Chicago.

**Hammers, Steam**  
Pittsburg Shear Knife & Mach. Co., Pittsburgh, Pa.

**Hammerlocks**  
Palmer, I. E., Middletown, Conn.  
Bicknell Hdw. Co., Janesville, Wis.

**Hand Screws**  
Bliss, R. Mfg. Co., Pawtucket, R. I.

**Handle Machinery**  
Defiance Machine Works, Defiance, O.

**Hangers, Barn Door**  
Myers, F. E. & Bro., Ashland, O.

**Hangers, Door**  
Chicago Spring Butt Co., Chicago, Ill.  
Coburn Trolley Track Mfg. Co., Holyoke, Mass.  
Cronk Hanger Co., Elmira, N. Y.  
Lane Bros., Poughkeepsie, N. Y.  
Lawrence Bros., Sterling, Ill.  
Louden Machinery Co., Fairfield, Iowa.  
McCabe Hanger Mfg. Co., 533-543 W. 23d St., N. Y.  
McKinney Mfg. Co., Allegheny, Pa.  
Ney Mfg. Co., Canton, Ohio.  
Stowell Mfg. & Foundry Co., So. Milwaukee, Wis.

**Wilcox Mfg. Co., Aurora, Ill.**

**Hangers, Shafting**  
Ball Bearing Co., Boston, Mass.  
Dodge Mfg. Co., Mishawaka, Ind.

**Hardware Comm'n Merchants**  
Graham, Jno. H. & Co., 113 Chambers St., N. Y.  
Hunkerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.

**Hardware Manufacturers**  
Arcade Mfg. Co., Freeport, Ill.  
Central Hardware Co., Phila.  
Logan & Strobbridge Iron Co., New Brighton, Pa.  
Millers Falls Co., 23 Warren St., N. Y.  
Ney Mfg. Co., Canton, Ohio.  
Nicol & Co., Chicago, Ill.  
Parker, Chas. Co., Meriden, Conn.  
Peck, Stow & Wilcox Co., 21 Murray St., N. Y.  
Southington Cutlery Co., Southington, Conn.  
Stanley Works, New Britain, Conn.  
Union Mfg. Co., 103 Chambers St., N. Y.  
Van Wagoner & Williams Hdw. Co., Cleveland, O.  
Wrightsville Hdw. Co., Wrightsville, Pa.

**Hardware Mfrs.' Agents**  
Graham, John H. & Co., 113 Chambers St., N. Y.  
Wiebusch & Hilger, Ltd., 9-15 Murray St., N. Y.

**Hardware Shelving**  
Warren, J. D. Mfg. Co., Chicago, Ill.

**Hardware Specialties**  
Acme Shear Co., Bridgeport, Conn.  
Berger Bros. Co., Philadelphia, Pa.  
Enterprise Mfg. Co., of Pa., Phila., Pa.  
Graham, John H. & Co., 113 Chambers St., N. Y.  
Pleuger & Henger Mfg. Co., St. Louis.  
Scranton & Co., The, New Haven, Ct.  
Smith & Egge Mfg. Co., Bridgeport, Ct.  
Smith & Hemenway Co., 296 Broadway, N. Y.

**Harness Snaps**  
Covert Mfg. Co., West Troy, N. Y.  
Covert's Saddlery Wks., Farmer, N. Y.  
Imperial Bit & Snap Co., Racine, Wis.

**Haps and Staples**  
McKinney Mfg. Co., Allegheny, Pa.

**Hay Chets**  
Jenins Iron & Tool Co., Howard, Pa.

**Hay Knives**  
Clark & Parsons Co., E. Wilton, Me.  
Ney Mfg. Co., Canton, Ohio.

**Hay Tools**  
Louden Machinery Co., Fairfield, Iowa.  
Myers, F. E. & Bro., Ashland, O.  
Ney Mfg. Co., Canton, O.

**Heating and Ventilating Apparatus**  
American Blower Co., Detroit, Mich.  
Bayley, Wm. & Sons Co., Milwaukee, Wis.  
Boston Blower Co., Hyde Park, Mass.  
Buffalo Forge Co., Buffalo, N. Y.  
Perrins, R. F. & Son, Holyoke, Mass.  
Sturtevant, H. F. Co., Boston, Mass.

**Heel Plates**  
Star Heel Plate Co., Newark, N. J.

**Hinges**  
Easy Spring Hinge Co., Shelby, O.  
Jenkins Iron & Tool Co., Howard, Pa.  
Lawrence Bros., Sterling, Ill.  
McKinney Mfg. Co., Allegheny, Pa.  
Stanley Works, New Britain, Conn.  
Tiebout, W. & J., 113 Chambers St., N. Y.

**Hitching Posts**  
Hartman Mfg. Co., 509 Broadway, N. Y.

**Hoes, Garden, Planters' &c.**  
Continental Tool Co., Frankfort, N. Y.  
Iowa Farming Tool Co., Fort Madison.  
Jenkins Iron & Tool Co., Howard, Pa.

**Hoists, Air**  
Pedrick & Ayer Co., Philadelphia, Pa.  
Ridgway, Craig & Son Co., Coatesville, Pa.

**Hoists, Chain and Rope**  
Box, Alfred & Co., Philadelphia, Pa.  
Eckstein, C. G., 249 Centre St., N. Y.  
Fulton Iron & Engine Works, Detroit, Mich.  
Harrington, E. Son & Co., Phila., Pa.  
McCoy, Jos. F. & Co., 26 Warren St.  
Reading Crane & Hoist Works, Reading, Pa.  
Speldel, J. G., Reading, Pa.

**Hoisting Machines**  
Eastern Machinery Co., New Haven, Ct.  
Lidgerwood Mfg. Co., 96 Liberty St., N. Y.

**Hollow Mill**  
Geometric Drill Co., Westville, Conn.

**Hollow Ware**  
Avery Stamping Co., Cleveland, Ohio.  
Cleveland Stamping & Tool Co., Cleveland, O.  
New York Stamping Co., Brooklyn, N. Y.  
Rogers, Jno. M. Boat-Gauge & Drill Works, Gloucester, City, N. J.

**Horse Nails**  
Capwell Horse Nail Co., Hartford, Ct.  
Mooney, W. M. & Co., Aunabie Chas., N. Y.  
National Horse Nail Co., Vergennes, Vt.  
Putnam Nail Co., Neponset, Boston.  
Wiebusch & Hilger, Ltd., 9-15 Murray St., N. Y.

**Horse and Mule Shoes**  
American Steel & Wire Co., Chicago, Ill.  
Burden Iron Co., Troy, N. Y.  
Phoenix Horse Shoe Co., Poughkeepsie, Rhode Island Perkins Horse Shoe Co., Providence, R. I.

**Horsehoe Studs**  
Leonhart & Co., Berlin, Schoneberg, Germany.

**Hose**  
Boston Belting Co., Boston, Mass.  
Peerless Rubber Mfg. Co., 16 Warren Street, New York.

**Hose Couplings**  
Clark, W. J. & Co., Salem, Ohio.

**Hose Coupling, Air**  
Pedrick & Ayer Co., Philadelphia, Pa.

**Hose Washers**  
Canfield, H. O., Bridgeport, Conn.

**House Furnishing Specialties**  
Lloyd Mfg. Co., Minneapolis, Minn.  
Williams, A. C. Ravenna, O.

**Hydraulic Jacks**  
Dudgeon, Richard, 24 Columbia St., N. Y.  
Fender, A. L. Sons, Wilmington, Del.  
Watson-Stillman Co., 204 E. 43d St., N. Y.

**Hydraulic Machinery**  
Watson-Stillman Co., 204 E. 43d St., N. Y.

**Hydraulic Presses**  
Correll, J. B. & J. M., 25th St. and 11th Ave., N. Y.

**Hydraulic Tools**  
Watson-Stillman Co., 204 E. 43d St., N. Y.  
Wood, R. D. & Co., Phila., Pa.

**Ice Cream Freezers**  
North Bros. Mfg. Co., Philadelphia, Pa.  
White Mountain Freezer Co., Nashua, N. H.

**Ice Making Machinery**  
York Mfg. Co., York, Pa.

**Ice Picks**  
Erie Specialty Co., Erie, Pa.

**Ice Shredders**  
Enterprise Mfg. Co., Philadelphia, Pa.  
Erie Specialty Co., Erie, Pa.

**Ice Tools**  
Gerlach, Peter & Co., Cleveland, O.  
Williams, A. C. Ravenna, O.  
Wood, Wm. T. Co., Arlington, Mass.

**Injectors**  
Jenkins Bros., New York.  
Watson, N. A., Erie, Pa.

**Insurance, Boiler**  
Hartford Steam Boiler Inspection and Insurance Co., Hartford, Conn.

**Iron and Steel, Swedish**  
Harley, Arthur Co., Boston, Mass.  
Lillenberg, N., 159 Broadway, N. Y.  
Milne, A. C. & Co., 1 Broadway, N. Y.  
Potts, Horace T. & Co., Phila., Pa.

**Iron Commission Brokers**  
Cahoon & Co., Phila., Pa.  
Cotton, Barclay W. & Co., Phila., Pa.  
Cox, Justice, Jr. & Co., Ltd., Phila., Pa.

**Etting, Edw. J., Philadelphia.**  
Keeley, Jerome & Co., Philadelphia.  
Law, Ernest & Co., Phila., Pa.  
Levy, Henry & Co., Philadelphia.  
Len, J. Taitall & Co., Philadelphia.  
Mohr, J. J., 430 Walnut St., Philadelphia.  
Thomas, Theodore, Utica, N. Y.  
Wister, L. & Co., Phila., Pa.

**Iron, Manufacturers**  
Newirk, J. B. & Co., Philadelphia, Pa.  
Republic Iron & Steel Co., Chicago, Ill.

**Merchants.**  
Bole, Ross & Co., Pittsburgh, Pa.  
Cotton, Barclay W. & Co., Phila.  
Cuniffe, H. M., Phila., Pa.  
Law, Ernest & Co., Phila., Pa.  
McInnes, C. E. & Co., Phila., Pa.  
Ogden & Wallace, 577-583 Greenwich St., N. Y.  
Pierano & Co., 29 Broadway, N. Y.  
Potts, Horace T. & Co., Phila., Pa.  
Thomson, W. H. & Co., Phila., Pa.  
Wallace, Wm. H. & Co., 66 B'way, N. Y.  
Wheeler, Moffitt & Co., Phila., Pa.  
Wilson, E. H. & Co., Philadelphia.

**Importers**  
Wheelock-Lovejoy & Co., New York and Boston.

**Iron, Galvanized Sheet—See Sheets, Galvanized.**

**Iron Sheet—See Sheets, Iron and Steel.**

**Iron Ore**  
Nicoll, B. & Co., 59-61 Wall St., N. Y.  
Pilling & Crane, Phila., Pa.  
Pullman, J. Wesley, Phila., Pa.

**Ironwork, Ornamental**  
Adam, W. J., Joliet, Ill.  
Barnum, E. T., Detroit, Mich.  
Carnegie Iron & Wire Co., Chattanooga, Tenn.  
Van Dorn Iron Wks. Co., Cleveland, O.

**Job Lots, Hardware**  
Chicago House Wrecking Co., Chicago, Ill.

**Joist Hanger**  
Van Dorn Iron Wks. Co., Cleveland, O.

**Keys**  
Bell, Edwin & Sons Co., Youngstown, O.

**Keys, Machine**  
Morton Mfg. Co., Muskegon Heights, Mich.

**Keys, Split and Riveted**  
Hollinger Fence Co., Greenville, O.

**Key Seaters**  
Baker Bros., Toledo, Ohio.

**Keyway Cutters**  
Morton Mfg. Co., Muskegon Heights, Mich.

**Knife and Tool Grinder**  
Union Mfg. Co., Buffalo, N. Y.

**Knives**  
Jackson Knife & Shear Co., Fremont, O.  
Kimball, C. J. Co., Bennington, N. H.

**Laboratory Outfits**  
Elmer & Amend, New York.

**Ladders**  
Handy Ladder Works, Cleveland, O.

**Lamps, Gasoline**  
Noite Brass Co., Springfield, O.

**Lamp Stoves**  
Litchfield, J. M., 105 Beekman St., N. Y.

**Lasts and Last Stands**  
Kupferle, Jno. C., St. Louis, Mo.  
Pleuger & Henger Mfg. Co., St. Louis, Mo.  
Stowell Mfg. & Foundry Co., So. Milwaukee, Wis.

**Lathe Dogs**  
LeCount, Wm. G. So. Norwalk, Conn.

**Lathes**  
American Tool Works Co., Cincinnati, Ohio.  
Barker-Charl Mch. Tool Co., Cincinnati, Ohio.  
Barnes, B. F. & Co., Rockford, Ill.  
Brown & Sharpe Mfg. Co., Providence, R. I.  
Bullard Mach. Tool Co., Bridgeport, Ct.  
Davis, W. F. Machine Co., Rochester, N. Y.  
Draper Mch. Tool Co., Worcester, Mass.  
Fish, H. C. Mch. Works, Worcester, Mass.  
Harrington, E. Son & Co., Phila., Pa.  
Johnson, Israel H., Jr. & Co., Phila., Pa.  
Jones & Lanson Mch. Co., Springfield, Vt.  
Lodge & Shipley Mch. T. of Co., Cincinnati, O.  
McCabe, J. J., 14 Dey St., N. Y.  
New Haven Mfg. Co., New Haven, Ct.  
Pond Machine Tool Co., Joliet, Ill.  
Potter & Johnson Co., Pawtucket, R. I.  
Pratt & Whitney Co., Hartford, Conn.  
Prentice Bros., Worcester, Mass.  
Schumacher & Boye, Cincinnati, O.  
Seneca Falls Mfg. Co., Seneca Falls, N. Y.  
Sisk, Anderson Co., Cincinnati, Ohio.  
Young, W. C. Mfg. Co., Worcester, Mass.

**Lathe Tools**  
Armstrong Bros. Tool Co., Chicago, Ill.

**Lathing, Wire**  
Clinton Wire Cloth Co., Clinton, Mass.  
N. J. Wire Cloth Co., Trenton, N. J.  
Wright & Colton Wire Cloth Co., Worcester, Mass.

**Lawn Mowers**  
Coldwell Lawn Mower Co., Newburgh, N. Y.  
Supplier Hardware Co., Phila., Pa.

**Lawn Mower Sharpeners**  
Wilcox Mfg. Co., Aurora, Ill.

**Lawn Sprinklers**  
Kupferle, Jno. C., St. Louis, Mo.  
McGowan, John H. Co., Cincinnati, O.  
Pleuger & Henger Mfg. Co., St. Louis, Mo.

**Lead Washers**  
Littlefield Bros., Cincinnati, Ohio.

**Lemon Squeezers**  
Hagen & Reid, Troy, N. Y.  
Williams, A. C. Ravenna, O.

**Link Belting**  
Hubb Malleable Co., Detroit, Mich.

**Lockers**  
Narasansett Mch. Co., Providence, R. I.

**Locks and Knobs**  
Central Hardware Co., Phila., Pa.  
Norwalk Lock Co., So. Norwalk, Conn.  
Reading Hdw. Co., Reading, Pa.  
U. S. Steel Lock Co., Clinton, Iowa.

**Locomotives**  
Everson, B. M., Pittsburgh, Pa.



**Logging Tools**

Gerlach, Peter &amp; Co., Cleveland, Ohio.

**Lubricants**Dixon, Jos. Crucible Co., Jersey City  
now Flake Axle Grease Co., Boston.**Lumbering Tools**

Morley Bros., Saginaw, Mich.

**Lunch Boxes**

Seavey Mfg. Co., Boston, Mass.

**Machinery**Acme Machinery Co., Cleveland, Ohio.  
Ajax Mfg. Co., Cleveland, Ohio.  
American Tool Wks. Co., Cincinnati, O.  
Baldr, U. Machinery Co., Pittsburgh, Pa.  
Barnes, W. F. & John Co., Rockford, Ill.  
Baugh Mch. Tool Co., Springfield, Mass.  
Becker Pralard Milling Mach. Co.,  
Hyde Park, Mass.Bliss E. W. Co., Brooklyn, N. Y.  
Bowler, Geo. H., Cleveland, O.  
Briggs, Marvin, 12 Broadway, N. Y.  
Brown & Sharpe Mfg. Co., Providence.  
Bullard Mch. Tool Co., Bridgeport, Ct.  
Carlin Machinery & Supply Co., Allegheny, Pa.Carlin's Sons Thos., Allegheny, Pa.  
Cincinnati Milling Mach. Co., Cin. O.  
Cincinnati Planer Co., Cincinnati, O.  
Cincinnati Shaper Co., Cincinnati, O.  
Cook, T. W. G. & Sons, N. Y.  
Cornell, J. B. & J. M., 26th St. and 11th  
Ave., New York City.Davis, W. P. Machine Co., Rochester, N. Y.  
Dawson, A. L. & Co., Chicago, Ill.  
Detrick & Harvey Mch. Co., Baltimore, Md.Diamond Drill & Mch. Co., Birdsboro, Pa.  
Donn, J. B. & Co., Chicago, Ill.Draper Mach. Tool Co., Worcester, Mass.  
Du Bois Iron Works, Du Bois, Pa.  
Farrell Fdry & Mch. Co., Australia, Conn.  
Ferracute Machine Co., Bridgeport, N. J.  
Fish, A. C. Machine Works, Worcester, Mass.Garvin Machine Co., Spring and Varick  
Sts., N. Y.General Supply Co., 40 John St., N. Y.  
Geometric Drill Co., Westville, Conn.  
Gray, Robt. J., 32 54 E. 12d St., N. Y.Han-son & Finlon, Springfield, Mass.  
Harris Mach. & Co., Minneapolis, Minn.Hendey Machine Co., Torrington, Conn.  
Hill, Henry F., Boston, Mass.Hill, Clarke & Co., Boston, Mass.  
Johnson Israel H., Jr., & Co., Phila.

Johnson, Wm. C. &amp; Sons Mch. Co., St. Louis, Mo.

Kaiser, A. V. & Co., Phila., Pa.  
Keagy & Lear Mch. Co., Coshocton, O.Lodge & Shipley Mch. Tool Co., Cin., O.  
Lund, S. T., Boston, Mass.McCabe, J. J., 14 Dey St., N. Y.  
McLowe & Co., Iturbur, Pa.McDowell Stocker & Co., Chicago.  
Machinists' Supply Co., Rochester, N. Y.Manning, Maxwell & Moore, 85-89 Liberty  
St., N. Y.Manville E. J. Mach. Co., Waterbury, Ct.  
Marshall & Hushart Mch. Co., Chicago, Ill.Mossberg, Frank Co., Attleboro, Mass.  
National Machine & Tool Co., Tiffin, Ohio.New Doty Mfg. Co., Kansasville, Wis.  
New Haven Mfg. Co., New Haven, Conn.New York Machinery Depot, 178 Broad-  
way, New York.Niles Tool Works Co., 138 Liberty  
St., N. Y.Nilson, A. H. Mch. Co., Bridgeport, Ct.  
Paradox Machinery Co., Chicago, Ill.Pennsylvania Machine Co., Phila., Pa.  
Phila. Machine Tool Co., Phila., Pa.Pittsburgh Mfg. Co., Pittsburgh, Pa.  
Pond Machine Tool Co., Plainfield, N. J.Poole, Robt. & Son Co., Baltimore, Md.  
Potter & Johnston Co., Pawtucket, R. I.Poulter & Co., Phila., Pa.  
Pratt & Whitney Co., Hartford, Conn.Prentice Bros., Worcester, Mass.  
Preston Tool & Supply Co., 115 Liberty  
St., N. Y.Reimer & Williams, Chicago, Ill.  
Reide, Wm. A., Cleveland, O.Seyfert's Sons L. F., Philadelphia, Pa.  
Sigourney Tool Co., Hartford, Conn.Silk, Anderson Co., Cincinnati, Ohio.  
Thomas & Lowe Machinery Co., Provi-  
dence, R. I.Toomey, Frank, Philadelphia, Pa.  
Waterbury Farrel Foundry & Mch. Co.,  
Waterbury, Conn.Wetherill Robert & Co., Chester, Pa.  
Windsor Machine Co., Windsor, Vt.Wormer, C. C. Mch. Co., Detroit, Mich.  
York, S. M. Co., Cleveland, O.**Machinery, Wood Working**American Mach. & Tool Co., Grand Rapids,  
Michigan.DeLancey Machine Wks., DeLancey, O.  
F. Y. J. A. & Egan Co., Cincinnati, O.**Machinery Springs**

Scott, Chas. Spring Co., Phila., Pa.

**Machinery Builders**Chapman, J. B. & Co., Springfield, Mass.  
Projectile Co., Brooklyn, N. Y.**Machinery Knives**

Lloyd, John Co., 558-562 Water St., N. Y.

**Machinery Screws—See Screws, Machine****Machine Screw Work**Spencer Automatic Mch. Screw Co.,  
Hartford, Conn.**Machine Tools—See Machinery****Machine Work**

Nurth, R. O. Co., Pittsburgh, Pa.

Billings &amp; Spencer Co., Hartford, Conn.

Machinists' Scales

Starrett, L. S. Co., Athol, Mass.

Machinists' Tools and Supplies

Billings &amp; Spencer Co., Hartford, Conn.

General Supply Co., 40 John St., N. Y.

Revsone Mfg. Co., Buffalo, N. Y.

King, J. M. &amp; Co., Waterford, N. Y.

Magnetic Separators

Cresson, Geo. V. Co., Phila., Pa.

Manganese Bronze

Hungerford, U. T. Brass & Copper Co.,  
121 Worth St., N. Y.

Manufacturing Properties

Hillman, J. H. &amp; Co., Pittsburgh, Pa.

Manufacturing Sites

Chicago, Milwaukee & St. Paul R. R.,  
Chicago, Ill.Southern Railway Co., Washington,  
D. C.

Measuring Machines

Rogers, Jno. M. Ross, Gauge & Drill  
Wks., Gloucester City, N. J.**Meat Choppers**Brown, Jas. L., 16 Duane St., N. Y.  
Enterprise Mfg. Co. of Pa., Phila., Pa.  
Peck, Stow & Wilcox Co., 27 Murray St.,  
New York.Street, S. R. & Co., Rochester, N. Y.  
Woodruff, O. D., Potstow, Pa.**Metal Brokers**

American Metal Co., 52 Broadway, N. Y.

**Metals**Hendricks Bros., 42 Cliff St., N. Y.  
Hoteller, Theo. & Co., Buffalo, N. Y.Hungerford, U. T. Brass & Copper Co.,  
121 Worth St., N. Y.Rutter, A. T., 256 Broadway, N. Y.  
United Metals Selling Co., 11 Broadway,  
N. Y.**Metal Polish**

Hoffman, Geo. W., Indianapolis, Ind.

**Metal Spinning**

Godwin &amp; Kintz Co., Winsted, Conn.

**Milling Machines**Adams Co., Dubuque, Iowa.  
Becker-Brinard Milling Machine Co.,  
Hyde Park, Mass.Brown & Sharpe Mfg. Co., Providence.  
Carter & Hake Mach. Co., Winsted, Ct.Cincinnati Milling Mach. Co., Cin., O.  
Fox Machine Co., Grand Rapids, Mich.Garvin Machine Co., Spring and Varick  
Sts., N. Y.Ingersoll Milling Mach. Co., Rockford,  
Ill. & Tool Works Co., 136-138 Liberty  
St., N. Y.Shuster, F. B. Co., New Haven, Conn.  
Thurston Mfg. Co., Providence, R. I.**Mining Knives**Bishop, Geo. H. & Co., Cincinnati, O.  
Palmer Hdw. Mfg. Co., Troy, N. Y.**Mining Machinery**Allis, E. P. Co., Milwaukee, Wis.  
Rand Drill Co., 100 Broadway, N. Y.**Mining Screens**Harrington & King Perforating Co.,  
Chicago, Ill.Howard & Morse, 45 Fulton St., N. Y.  
Michigan Wire Cloth Co., Detroit, Mich.**Miter Boxes**

Thomson Bros. &amp; Co., Lowell, Mass.

**Molding Machines**Adams Co., Dubuque, Iowa.  
Maywood Fdry. & Mch. Co., Chicago.

Primmore, Henry E., Chicago, Ill.

**Motor Fans**Hungerford, U. T. Brass & Copper Co.,  
121 Worth St., N. Y.**Motors, Air**

Stow Flexible Shaft Co., Phila., Pa.

**Motors, Electric**Eddy Electric Mfg. Co., Windsor, Conn.  
General Electric Co., Schenectady, N. Y.Stewart Electric Co., Cincinnati, O.  
Sturtevant, E. P. Co., Boston, Mass.Westinghouse Elec. & Mfg. Co., Pitts-  
burgh, Pa.**Nail Clippers**

Cook, H. C. Co., Ansonia, Conn.

**Nail Machinery**

Pittsburgh Mfg. Co., Pittsburgh, Pa.

**Nail Pullers**Bridgeport Mfg. Co., Bridgeport, Conn.  
Hagen & Reid, Troy, N. Y.Scranton & Co., The, New Haven, Conn.  
Snow, L. T., New Haven, Conn.**Name Plates, Machinery**

Murdock Parlor Grate Co., Boston, Mass.

**Natural Gas Pumps**

Norwalk Iron Wks. Co., So. Norwalk, Ct.

**Nickel Platers' Supplies**Eddy Electric Mfg. Co., Windsor, Conn.  
Hanson & Van Winkle Co., Newark, N. J.Zucker & Levett & Loeb Co., 525-530 W.  
25th St., New York.**Nickeloid**

American Nickeloid Co., Peru, Ill.

**Norway Shapes**Rowland, William & Harvey, Frank-  
ford, Philadelphia.

Nuts—See Bolts

Nuts, Self-Locking

National Elastic Nut Co., Milwaukee,  
Wis.

Nut Machines

Dunham Nut Co., Unionville, Conn.

Oil Burners

Burn H. Carbon Burner Co., Fort  
Pike, N. Y.

Oil Burning Appliances

Rockwell Engineering Co., 26 Cortlandt  
St., N. Y.

Oil Extractor

Reed & Curtis Mch. Screw Co., Worces-  
ter, Mass.

Oil Heaters—See Oil Stoves.

Oil Stones

Pike Mfg. Co., Pike Station, N. H.

Oil Stoves—(See Stoves Oil, Vapor and  
Gasoline)

Oilers

Gem Mfg. Co., Pittsburgh, Pa.  
Hammer & Co., Branford, Conn.Routenburg Mfg. Co., Keithsburg, Ill.  
Wilmot & Hobbs Mfg. Co., Bridgeport,  
Conn.

Oilless Bearings

North American Metalline Co., Long  
Island City, N. Y.

Ore Breakers

Aultman Co., Canton, O.  
Cresson, Geo. V. Co., Phila., Pa.

Ores

Blair, Reez F. Co., Pittsburgh, Pa.  
Samuel, Frank, Philadelphia, Pa.

Wheeler, Frank, Philadelphia, Pa.

Ovens, Portable

Blodgett, G. S. Co., Burlington, Vt.

Ox Shoes

Scranton Forging Co., Scranton, Pa.  
Woodruff, Walter W. & Sons, Mt. Carmel,  
Conn.

Packing

Boston Belting Co., Boston, Mass.  
Morrison, Robert, St. Louis, Mo.Peerless Rubber Mfg. Co., 16 Warren  
Street, N. Y.

Packing, Iron

Smooth On Mfg. Co., Jersey City, N. J.

Paddocks

Graham, John H. & Co., 113 Chambers  
Street, New York.

Paints

Dixon, Jos. Crucible Co., Jersey City.

**Pants Stretcher**

Covert Mfg. Co., West Troy, N. Y.

**Patent Solicitors**Goepel & Rargener, 290 Broadway,  
N. Y.Howson & Howson, Philadelphia and  
Washington.

Stocking, E. B., Washington, D. C.

**Patterns**Balkwill Pattern Wks., Cleveland, O.  
Norwalk Pattern & Mfg. Co., So. Nor-  
walk, Conn.Mt. Vernon Pattern & Model Works,  
Mt. Vernon, O.**Pattern Letters**Rutler, A. G., 103 Beekman St., N. Y.  
Cleveland Galvanizing Works, Cleve-  
land, O.**Perforated Metal**Clinton Wire Cloth Co., Clinton, Mass.  
Harrington & King Perforating Co., Chi-  
cago, Ill.Hungerford, U. T. Brass & Copper Co.,  
121 Worth St., N. Y.**Phosphor Bronze**Hungerford, U. T. Brass & Copper Co.,  
121 Worth St., N. Y.Phosphor Bronze Smelting Co., Limited,  
Philadelphia.**Phosphor Tin**Crescent Phosphorized Metal Co., Phila-  
delphia, Pa.Halk & Naumann, 518 Pearl St., N. Y.  
Syracuse Smelting & Ss., Syracuse, N. Y.**Picture Wire**

Osawana Mills Co., Norwich, Conn.

**Pig Casting Machines**

Heyl &amp; Patterson, Pittsburgh, Pa.

**Pig Iron**Alabama Consolidated Coal & Iron Co.,  
Birmingham, Ala.

Ashland Steel Co., Ashland, Ky.

Beard, C. R. &amp; Co., Phila., Pa.

Cherry Valley Iron Co., Pittsburgh, Pa.

Dimmick, J. K. &amp; Co., Phila., Pa.

Hickman, Williams &amp; Co., Chicago, Ill.

Houston, C. B. &amp; Co., Philadelphia, Pa.

Nicoli, B. &amp; Co., 50-52 Wall St., N. Y.

Samuel, Frank, Philadelphia, Pa.

Sloss-Heffeld Steel & Iron Co., Bir-  
mingham, Ala.

Sydney, W. F. &amp; Co., Pittsburgh, Pa.

Superior Charcoal Iron Co., Grand Rap-  
ids, Mich.Tennessee Coal, Iron & R. R. Co., Bir-  
mingham, Ala.Virginia Iron, Coal and Coke Co., Bris-  
tol, Va.—Tenn.**Pig Iron Analysis**

Church, S. R., San Francisco, Cal.

**Pig Iron Storage**Am. Pig Iron Storage Warehouse Co., 4  
Wall St., N. Y.**Pile Drivers**

Vulcan Iron Works, Chicago, Ill.

**Pipe, Bent**Harrisburg Pipe Bending Co., Harris-  
burg, Pa.National Pipe Bending Co., New Haven,  
Conn.

National Tube Co., Pittsburgh, Pa.

Whitlock Coil Pipe Co., Hartford, Ct.

**Pipe Coupling**

Williams, J. H. &amp; Co., Brooklyn, N. Y.

**Pipe Crimpers**

Berridge Shear Co., Sturgis, Mich.

**Pipe Cutting and Threading Ma-  
chines**

Armstrong Mfg. Co., Bridgeport, Conn.

Bignell & Keeler Mfg. Co., Edwards-  
ville, Ill.

Curtis &amp; Curtis, Bridgeport, Conn.

Jarecki Mfg. Co., Erie, Pa.

Merrill Mfg. Co., Toledo, O.

Saunders' Sons, D., Yonkers, N. Y.

**Pipe Grips**

Prentiss Vise Co., 44 Barclay, N. Y.

**Pipe Snips**

Berridge Shear Co., Sturgis, Mich.

**Pipes, Fittings, &c.**

Jarecki Mfg. Co., Erie, Pa.

McNab &amp; Harlin Mfg. Co., N. Y.

**Pipe, Riveted Steel**

Pollock, W. R. Co., Youngstown, O.

Scaife, Wm. R. &amp; Sons, Pittsburgh.

Warren City Boiler Works, Warren, O.

Pipe, Water and Gas

Mitt, C. &amp; Son Co., Utica, N. Y.

National Tube Co., Pittsburgh, Pa.

Red Jacket Mfg. Co., Davenport, Iowa.

U. S. Cast Iron Pipe & Foundry Co.,  
Phila., Pa.

Wood, R. D. &amp; Co., Philadelphia, Pa.

Piston Rods, Tobin Bronze

Ansonia Brass & Copper Co., 99 John  
St., N. Y.

Planes

Stanley Rule &amp; Level Co., N. Y.

Planers

Amer. Tool Works Co., Cincinnati, O.

Baldr, U. Machinery Co., Pittsburgh, Pa.

Cincinnati Planer Co., Cincinnati, Ohio.

Detrick &amp; Harvey Mch. Co., Baltimore.

Draper Mch. Tool Co., Worcester, Mass.

Pond Machine Tool Co., Plainfield, N. J.

Whitcomb Mfg

**Razor Hones**

Pike Mfg. Co., Pike Station, N. H.

**Reading Stands**

Allica, D. H. &amp; Co., Miamisburg, O.

**Reamers**

Morse Twist Drill &amp; Mch. Co., New Bedford, Mass.

**Recording Gauges**

Bristol Co., Waterbury, Conn.

Uehling, Steinbart &amp; Co., Ltd., Carlstadt, N. J.

**Reels**

Hendryx, A. B. Co., New Haven, Conn.

**Refrigerating Machinery**

York Mfg. Co., York, Pa.

**Refrigerators**

Maine Mfg. Co., Nashua, N. H.

**Registers**

Seavey Mfg. Co., Boston, Mass.

Stowell Mfg. &amp; Foundry Co., So. Milwaukee, Wis.

**Relaying Rails**

Donaldson &amp; Newton, Phila., Pa.

Isaac Joseph Iron Co., Cincinnati, O.

May &amp; Spalding, 32 Broadway, N. Y.

Steel Rail Supply Co., 100 B'way, N. Y.

**Relining Tools**

Bridgeport Gun Implement Co., 313-315 Broadway, N. Y.

Hungerford, U. T., Brass &amp; Copper Co., 121 Worth St., N. Y.

Ideal Mfg. Co., New Haven, Conn.

**Repairing Sets, Family**

Micheil, W. B. Chicago, Ill.

Schreyer, M. Sons &amp; Co., Chicago, Ill.

Star Heel Plate Co., Newark, N. J.

**Repair Outfits, Farmers'**

Imperial Bit &amp; Snap Co., Racine, Wis.

**Revolution Counters**

Pickin, A. B. Machinery Co., Providence, R. I.

Tabor Mfg. Co., Elizabeth, N. J.

**Revolvers**

Harrington &amp; Richardson Arms Co., Worcester, Mass.

Johnson, Iver, Arms &amp; Cycle Works, Fitchburg, Mass.

**Rheostats**

Electric Controller &amp; Supply Co., Cleveland, O.

**Rifles**

Marlin Fire Arms Co., New Haven, Ct.

Remington Arms Co., 615 B'way, N. Y.

Stevens Arms &amp; Tool Co., Chicopee Falls, Mass.

**Ring Rollers**

Shuster, F. B. Co., New Haven, Conn.

**Riveters**

Phila. Pneumatic Tool Co., Phila., Pa.

**Rivets**

American Iron &amp; Steel Mfg. Co., Lebanon, E.

American Screw Co., Providence, R. I.

Blake &amp; Johnson, Waterbury, Conn.

Burden Iron Co., Troy, N. Y.

Clark &amp; Cowles, Plainville, Conn.

Cobb &amp; Drew, Plymouth, Mass.

Hungerford, U. T., Brass &amp; Copper Co., 121 Worth St., N. Y.

McInnes, C. E. &amp; Co., Phila., Pa.

Plymouth Mills, Plymouth, Mass.

Rockford Bolt Works, Rockford, Ill.

Townsend C. C. &amp; E. P., New Brighton, Pa.

**Riveting Machines**

Bethlehem Foundry &amp; Mch. Co., So. Bethlehem, Pa.

Shuster, F. B. Co., New Haven, Conn.

**Roll Mill Machinery**

Bradcock Machine &amp; Mfg. Co., Bradock, Pa.

Morgan Construction Co., Worcester, Mass.

**Roll Turning Tools**

Trethewey, Sam'l &amp; Co., Ltd., Pittsburgh

**Roller Bearings**

Ball Bearing Co., Boston, Mass.

Moosberg &amp; Granville Mfg. Co., Providence, R. I.

**Rolling Mill Machinery**

Booth, The Lloyd Co., Youngstown, O.

Everson, B. M., Pittsburgh, Pa.

Farrell Fdry. &amp; Mch. Co., Ansonia, Ct.

Frank-Kneeland Mch. Co., Pittsburgh

Garrison, A. Foundry Co., Pittsburgh

Mesta Machine Co., Pittsburgh, Pa.

Morgan Construction Co., Worcester, Mass.

Moosberg &amp; Granville Mfg. Co., Providence, R. I.

Penn. Engineering Wks., New Castle, Penna.

Totten &amp; Hogg Iron &amp; Steel Fdry. Co., Pittsburgh, Pa.

**Rolls, Chilled, Sand and Steel**

Booth, The Lloyd Co., Youngstown, O.

Farrell Fdry. &amp; Mch. Co., Ansonia, Ct.

Frank-Kneeland Mch. Co., Pittsburgh

Garrison, A. Foundry Co., Pittsburgh

Mesta Machine Co., Pittsburgh, Pa.

Morgan Construction Co., Worcester, Mass.

Moosberg &amp; Granville Mfg. Co., Providence, R. I.

Penn. Engineering Wks., New Castle, Penna.

Totten &amp; Hogg Iron &amp; Steel Fdry. Co., Pittsburgh, Pa.

**Roofing and Siding**

Asphalt Ready Roofing Co., 136 Water St., N. Y.

Garry Iron &amp; Steel Roofing Co., Cleveland, O.

Scaife, Wm. B. &amp; Sons, Pittsburgh

Youngstown Iron &amp; Steel Roofing Co., Youngstown, O.

**Rope and Cordage**

American Mfg. Co., 66 Wall St., N. Y.

Waterbury Rope Co., 69 South St., N. Y.

**Rope and Web Goods**

Covert Mfg. Co., West Troy, N. Y.

**Rope Shield**

Ironides Co., Columbus, Ohio.

**Rope Transmission and Hoisting**

American Mfg. Co., 66 Wall St., N. Y.

California Wire Works, San Francisco, Cal.

Hunt, C. W. Co., West New Brighton, N. Y.

Leachen, A. &amp; Sons, Rope Co., St. Louis, Mo.

Woolf, T. B. Sons, Chambersburg, Pa.

**Rubber Goods**

Boston Belting Co., Boston, Mass.

Canfield, H. O., Bridgeport, Conn.

Peerless Rubber Mfg. Co., 16 Warren Street, N. Y.

**Rubber Scrap**

Botteler, Theo. &amp; Co., Buffalo, N. Y.

**Rules**

Larkin Rule Co., Saginaw, Mich.

Stanley Rule &amp; Level Co., 39 Chambers St., N. Y.

**Sad Irons**

Enterprise Mfg. Co., Phila., Pa.

Williams, A. C., Ravenscroft, O.

**Sand Blast Apparatus**

Ward, Edgar T. &amp; Sons, Boston, Mass.

**Sand Paper**

Baeder, Adamson &amp; Co., Phila., Pa.

**Sash Balances**

Caldwell Mfg. Co., Rochester, N. Y.

Pullman Sash Balance Co., Rochester, N. Y.

Streeter, N. H. &amp; Co., Rochester, N. Y.

**Sash Cords and Chains**

Bridgeport Chain Co., Bridgeport, Conn.

Morton, Thos., 65 Elizabeth, N. Y.

Samson Cordage Works, Boston, Mass.

Silver Lake Co., Boston, Mass.

Smith &amp; Egge Mfg. Co., Bridgeport, Conn.

**Sash Locks**

Fitch, W. &amp; E. T. Co., The, New Haven, Conn.

Ives, H. B. &amp; Co., New Haven, Conn.

**Sash Pulleys**

Fox Machine Co., Grand Rapids, Mich.

Grand Rapids Hardware Co., Grand Rapids, Mich.

Palmer Hardware Mfg. Co., Troy, N. Y.

**Sash Weights**

Barney &amp; Reed Mfg. Co., Boston, Mass.

Brown, E. E. &amp; Co., Philadelphia, Pa.

Enterprise Foundry Co., Cincinnati, O.

**Sausage Stuffers**

National Specialty Mfg. Co., Phila., Pa.

**Saws**

Atkins, E. C. &amp; Co., Indianapolis, Ind.

Blahop, Geo. H. &amp; Co., Cincinnati, Ohio.

Diston, Henry &amp; Sons, Inc., Phila., Pa.

National Saw Co., Newark, N. J.

Simonds Mfg. Co., Fitchburg, Mass.

**Saw Clamps**

Diston, Henry &amp; Sons, Inc., Phila., Pa.

**Saw Guides**

Thomson Bros. &amp; Co., Lowell, Mass.

**Saw Handles**

Ladd, W. C., Bristol, Conn.

**Saw Sets**

Diston, Henry &amp; Sons, Inc., Phila., Pa.

Taintor Mfg. Co., 9 to 15 Murray, N. Y.

**Saw Tools**

Atkins, E. C. &amp; Co., Indianapolis, Ind.

**Scales**

Chattillon, John &amp; Sons, 85-89 Cliff, N. Y.

Chicago Scale Co., Chicago, Ill.

Pelouse Scale &amp; Mfg. Co., Chicago, Ill.

Standard Scale &amp; Supply Co., Pittsburgh

**Scrap Metals**

Armstrong, R. S. &amp; Bro., Atlanta, Ga.

Blake, M. J. &amp; M., 11th Ave. and 13th St., N. Y.

Botjer, C., Hoboken, N. J.

Greiner, F., Philadelphia, Pa.

Hittner, H. &amp; Sons, Phila., Pa.

Hofeller, Theo. &amp; Co., Buffalo, N. Y.

Leonard, John &amp; Co., 22 Broadway, N. Y.

Miles, E. O. &amp; Co., Atlan, a, Ga.

N. J. Iron &amp; Metal Co., Paterson, N. J.

Phillips, F. B. &amp; Sons Co., Phila., Pa.

Rogers, W. H., Bridgeport, Conn.

Samuels, M. Sons, Brooklyn, N. Y.

Smith, Morton B. Co., New York

**Scrap Metal Breakers**

Birdsboro Iron &amp; Steel Breaking Co., Birdsboro, Pa.

**Scrapers, Road**

American Steel Scraper Co., Sidney, O.

Atman Co., Canton, Ohio

Kilbourne &amp; Jacobs Mfg. Co., Columbus, Ohio

Sidney Steel Scraper Co., Sidney, O.

Syracuse Chilled Plow Co., Syracuse, N. Y.

**Screens, Perforated Metal**

Harrington &amp; King Perforating Co., Chicago, Ill.

**Screens, Window and Door**

Daroy, Edw. &amp; Sons, Philadelphia, Pa.

**Screw Cutting Dies**

Card, S. W. Mfg. Co., Mansfield, Mass.

Geometric Drill Co., Westville, Conn.

Rogers, Jno. M. Boat Gauge &amp; Drill Wks., Gloucester City, N. J.

Wells Bros. &amp; Co., Greenfield, Mass.

Wiley &amp; Russell Mfg. Co., Greenfield, Mass.

Winter Bros., Wrentham, Mass.

**Screw Drivers**

Braunsdorf-Mueller Co., Elizabeth, N. J.

Brown, R. H. &amp; Co., New Haven, Conn.

Goodell-Pratt Co., Greenfield, Mass.

Mayhew, H. H. Co., Shelburne Falls, Mass.

New England Specialty Co., No. Easton, Mass.

North Bros. Mfg. Co., Philadelphia, Pa.

Sawyer Tool Co., Fitchburg, Mass.

Tower &amp; Lyon, 35 Chambers St., N. Y.

Union Mfg. Co., Buffalo, N. Y.

**Screw Machine Products**

Dodge Machine Screw Co., Boston, Mass.

**Screw Machinery**

American Tool Wks. Co., Cincinnati, O.

Baker Bros., Toledo, O.

Brown &amp; Sharpe Mfg. Co., Providence, R. I.

Draper Mach. Tool Co., Worcester, Mass.

Garvin Machine Co., Springfield and Varick Sts., N. Y.

Jones &amp; Lamson Men. Co., Springfield, Vt.

Windsor Mch. Co., Windsor, Vt.

**Screws**

Coach

Hall's Sam'l Sons, 229 West 10th St., N. Y.

Haskell, Wm. H. Mfg. Co., Pawtucket, R. I.

**Machine**

American Screw Co., Providence, R. I.

Blake &amp; Johnson, Waterbury, Conn.

Chicago Screw Co., Chicago, Ill.

Haskell, Wm. H. Mfg. Co., Pawtucket, R. I.

Hubbell, Harvey, Bridgeport, Conn.

Illinois Screw Co., Chicago, Ill.

Miles, F. S., 35 Quarry, Philadelphia, Pa.

Nassau Screw Co., Buffalo, N. Y.

Phila. Mach. Screw Works, Phila., Pa.

Pittsburgh Screw &amp; Bolt Co., Pittsburgh, Pa.

Reed &amp; Curtis Mch. Screw Co., Worcester, Mass.

Rhode Island Tool Co., Providence, R. I.

Southington Cutlery Co., Southington, Conn.

Worcester Mch. Screw Co., Worcester, Mass.

**Wood**

American Screw Co., Providence, R. I.

Franklin Moore Co., Winsted, Conn.

Reading Hardware Co., Reading, Pa.

Reading Screw Co., Norrisown, Pa.

Southington Cutlery Co., Southington, Conn.

**Scroll Saws**

Barnes, W. F. &amp; John Co., Rockford, Ill.

Millers Falls Co., 23 Warren St., N. Y.

Seneca Falls Mfg. Co., Seneca Falls, N. Y.

**Scythe Stones and Whetstones**

Cleveland Stone Co., Cleveland, O.

Pike Mfg. Co., Pike Station, N. H.

**Seamless Steel Tubes**

Ivins Ellwood, 387 Broadway, N. Y.

Janney, Steinhilber &amp; Co., Phila., Pa.

National Tube Co., Pittsburgh, Pa.

**Security Snaps**

Sundries Mfg. Co., South Bend, Ind.

**Sewing Machines**

Demorest Mfg. Co., Williamsport, Pa.

National Sewing Machine Co., Belvidere, Ill.

**Shaft Coupling**

Fairbanks Co., 311 Broadway, N. Y.

Nicholson, W. H. &amp; Co., Wilkes-Barre, Pa.

**Shafting**

Crescent, Geo. V. Co., Philadelphia, Pa.

Dodge Mfg. Co., Mishawaka, Ind.

Fairmount Mch. Co., Philadelphia, Pa.

Finished Steel Co., Youngstown, O.

Jones &amp; Laughlins Co., Pittsburgh, Pa.

Pardee &amp; Sons, Perth Amboy, N. J.

Pittsburgh Steel Shafting Co., Rankin, Pa.

Stow Mfg. Co., Binghamton, N. Y.

Woods, T. B. Sons, Chambersburg, Pa.

**Shaped Iron and Steel**

Allentown Rolling Mill, Allentown, Pa.

American Steel Hoop Co., Battery Park Building, N. Y.

American Steel &amp; Wire Co., Chicago, Ill.

Forest City Steel &amp; Iron Co., Cleveland, Ind.

Lindsay, W. W. &amp; Co., Phila., Pa.

Lockhart Iron &amp; Steel Co., Pittsburgh, Pa.

National Steel Co., Bridgeport, Conn.

Passaic Rolling Mill Co., Paterson, N. J.

Phoenix Iron Co., Phila., Pa.

Pittsburgh Steel Shafting Co., Rankin, Pa.

Republic Iron &amp; Steel Co., Chicago, Ill.

**Shapers**

Barker-Chard Mach. Tool Co., Cincinnati, O.

Cincinnati Shaper Co., Cincinnati, O.

Gould &amp; Eberhardt, Newark, N. J.

Perkins Machine Co., Boston, Mass.

Potter &amp;



- Frankford Steel Co.**, Philadelphia.  
Hobson, Houghton & Co., 98 John St., N. Y.  
Jessop, Wm. & Sons, Sheffield, England, or St. John St., New York.  
Jones & Laughlin, Ltd., Pittsburgh, Pa.  
Kidd Bros. & Hargner Steel Wire Co., McKees Rocks, Pa.  
La Belle Steel Co., Pittsburgh, Pa.  
Lorain Steel Co., Lorain, Ohio.  
Lukens Iron & Steel Co., Coatesville, Pa.  
Nash, Geo. & Co., Chicago.  
National Steel Co., Battery Park Building, N. Y.  
Newkirk, J. B. & Co., Philadelphia, Pa.  
Otis Steel Co., Ltd., Cleveland, Ohio.  
Republic Iron & Steel Co., Chicago, Ill.  
Rowland, Wm. & Harvey, Frankford, Philadelphia.  
Singer, Nimick & Co., Inc., Pittsburgh.  
Wardlaw, S. & Co., Sheffield, England.  
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.  
**Manufacturers' Agents**  
Ogden & Wallace, 377-383 Greenwich St., New York.  
Snyder, W. P. & Co., Pittsburgh, Pa.  
Tennessee Coal, Iron & R. R. Co., Birmingham, Ala.  
Virginia Iron, Coal and Coke Co., Bristol, Va.—Tenn.
- Steel, Self Hardening**  
Denman & Davis, 85-87 John St., N. Y.
- Steel Rails**  
Lorain Steel Co., Lorain, Ohio.
- Steel Stamps and Stencil Dies**  
Eucker, L. A. Stamp Wks., Little Ferry, N. J.  
Ness, Geo. M., Jr., 61 Fulton St., N. Y.  
Schwerdtle & Siebert, Bridgeport, Conn.
- Steel, Tool**  
Braeburn Steel Co., Braeburn, Pa.  
Canton Steel Co., Canton, Ohio.  
Crescent Steel Co., Pittsburgh, Pa.  
Denman & Davis, 85-87 John St., N. Y.  
Frankford Steel Co., Philadelphia, Pa.  
Jessop, Wm. & Sons, Sheffield, England, 91 John St., N. Y.  
Jones, B. M. & Co., Boston, Mass.  
La Belle Steel Co., Pittsburgh, Pa.  
Nash, Geo. & Co., Chicago.  
Singer, Nimick & Co., Pittsburgh, Pa.
- Step Ladders**  
Handy Ladder Works, Cleveland, O.
- Step Ladders, Rolling**  
Bicycle Step Ladder Co., Chicago, Ill.  
Coburn Trolley Track Mfg. Co., Holyoke, Mass.  
Milbradt, G. A. & Co., St. Louis, Mo.  
Morley Bros., Saginaw, Mich.
- Sticks and Dies**  
Armstrong Mfg. Co., Bridgeport, Conn.  
Card, S. W. Mfg. Co., Mansfield, Mass.  
Curtis & Curtis, Bridgeport, Conn.  
Fairbanks Co., 311 Broadway, N. Y.  
Hollands Mfg. Co., Erie, Pa.  
Jones & Lamson Mch. Co., Springfield, Vt.  
Jarecki Mfg. Co., Erie, Pa.  
Oster Mfg. Co., Cleveland, Ohio.  
Saunders' Sons, D., Yonkers, N. Y.  
Wells Bros. & Co., Greenfield, Mass.  
Wiley & Russell Mfg. Co., Greenfield, Winter Bros., Wrentham, Mass.
- Stone Cutting Machinery**  
Gilmour, J., Bennett Bldg., N. Y.
- Stone Working Machinery**  
Patch, F. K. Mfg. Co., Rutland, Vt.
- Stop Screws**  
Head, A. P. & Co., Chicago, Ill.
- Store Fixtures**  
Warren, J. M. Mfg. Co., Chicago, Ill.
- Storm Window Fasteners**  
Woodruff, W. W. & Sons, Mt. Carmel, Ct.
- Stove Linings**  
Ostrander Fire Brick Co., Troy, N. Y.
- Stove Pipe Thimbles**  
Cheney, S. & Son, Manlius, N. Y.
- Stoves, Oil, Vapor and Gasoline**  
Schneider & Trenkamp Co., Cleveland, Ohio.
- Straightening Machines, Wire and Sheet Metal**  
Shuster, F. B. Co., New Haven, Conn.
- Structural Iron and Steel Work**  
American Bridge Co., East Berlin, Ct.  
Boston Bridge Works, Boston, Mass.  
Du Bois Iron Works, Du Bois, Pa.  
Eastern Bridge & Structural Co., Worcester, Mass.  
Forest City Steel & Iron Co., Cleveland, Ohio.  
Illinois Steel Co., Chicago, Ill.  
Moseley Iron Bridge & Roof Co., 39 Cortlandt St., N. Y.  
New England Structural Co., Boston, Mass.  
Phoenix Iron Co., Philadelphia, Pa.  
Ritter-Conley Mfg. Co., Pittsburgh, Pa.  
Stewart Iron Works, Cincinnati, Ohio.  
West Side Foundry Co., Troy, N. Y.
- Sulphuric Acid**  
Mathieson & Heiler Zinc Co., La Salle, Ill.
- Swaging Machine**  
Excelsior Needle Co., Torrington, Ct.
- Table Ware**  
International Silver Co., Meriden, Ct.
- Tacks, Brads, &c.**  
Diamond Tack & Nail Works, Raynham, Mass.  
Grand Crossing Tack Co., Grand Crossing, Ill.  
Milwaukee Tack Co., Milwaukee, Wis.  
Plymouth Mills, Plymouth, Mass.  
Kipley & Bartlett, Plymouth, Mass.  
Shelton Co., Birmingham, Conn.
- Tack and Nail Machinery**  
Kimball Bros. & Sprague, Brockton, Mass.  
Sweetzer, W. A., Brockton, Mass.
- Tanks, Iron and Steel**  
Scaife, Wm. R. & Sons, Pittsburgh.
- Tapes**  
Lufkin Rule Co., Saginaw, Mich.
- Tap Holder**  
Ideal Machine Works, Hartford, Conn.
- Tapping Machinery**  
Hobbs, Harry, Bridgeport, Conn.
- Taps and Dies**  
Besley, C. H. & Co., Chicago, Ill.  
Butterfield & Co., Derby Line, Vt.  
Card, S. W. Mfg. Co., Mansfield, Mass.  
Reece, E. F. Co., Greenfield, Mass.  
Wells Bros. & Co., Greenfield, Mass.  
Wiley & Russell Mfg. Co., Greenfield, Winter Bros., Wrentham, Mass.
- Telephones**  
Rawson Electric Co., Elvira, Ohio.
- Terne Plate**  
American Tin Plate Co., N. Y.
- Thimble Skeins**  
Mitchell, W. B., Chicago, Ill.
- Time Recorders**  
Chicago Time Register Co., Chicago, Ill.  
Nanz, C. & Co., 127 Duane St., N. Y.  
Simplex Time Recorder Co., Gardner, Mass.  
Waggoner Watchman Clock Co., Grand Rapids, Mich.
- Tin Mills**  
Philadelphia Roll & Mch. Co., Phila., Pa.  
Phillips, F. B. & Sons Co., Phila., Pa.
- Timbers' Tools and Machines**  
Niagara Machine & Tool Works, Buffalo.
- Tin Plate**  
American Tin Plate Co., N. Y.  
Champion Iron & Steel Co., Muskegon, Mich.  
Merchant & Co., Inc., Philadelphia, Pa.
- Tin Plate Machinery**  
Lloyd Booth Co., Youngstown, Ohio.
- Tinware**  
Keen & Hagerty, Baltimore, Md.  
Seamless Metal Ware Co., 277 Broadway, N. Y.
- Tinware Machinery**  
Shuster, F. B. Co., New Haven, Conn.
- Tobin Bronze**  
Ansonia Brass & Copper Co., 99 John St., N. Y.
- Toe Calks, Steel**  
Burke, P. F., Boston, Mass.
- Tool Chests**  
Am. Tool Chest Co., 300 W. Houston St., New York.  
Jones, B. M. & Co., Fawtucket, R. I.
- Tool Grinders**  
Sellers, Wm. & Co., Inc., Phila., Pa.  
Union Mfg. Co., Buffalo, N. Y.
- Tool Holders**  
Hogson & Pettis Mfg. Co., New Haven, Conn.
- Tools**  
Athol Machine Co., Athol, Mass.  
Brown, R. H. & Co., New Haven, Conn.  
Goodell Pratt Co., Greenfield, Mass.  
Mayhew, H. H. Co., Shelburne Falls, Mass.  
Millers Falls Co., 38 Warren St., N. Y.  
Springfield Machine Screw Co., Springfield, Mass.  
Stanley Rule & Level Co., 39 Chambers St., New York.  
Starratt, L. S. Co., Athol, Mass.  
Stevens, J. A. Arms & Tool Co., Chicopee, Mass.  
Tower & Lyon, 38 Chambers St., N. Y.
- Tools, Blacksmith and Wheelwright**  
Champion Blower & Forge Co., Lancaster, Pa.  
Wiley & Russell Mfg. Co., Greenfield, Mass.
- Tools, Steam and Gas Fitters'**  
Saunders' Sons, D., Yonkers, N. Y.
- Torches, Oil and Gasoline**  
Schneider & Trenkamp Co., Cleveland, O.
- Tote Boxes**  
Clark, W. J. & Co., Salem, O.
- Transom Openers**  
Ormsby, E. A., Melrose, Mass.
- Tree Guard**  
Hartman Mfg. Co., 309 Broadway, N. Y.  
Up-to-date Mfg. Co., Terre Haute, Ind.
- Trolleys**  
Box, Alfred & Co., Philadelphia, Pa.
- Trowels**  
Bishop, Geo. H. & Co., Cincinnati, O.  
National Saw Co., Newark, N. J.
- Trucks**  
Boston & Lockport Block Co., Lockport, Fairbanks Co., 311 Broadway, N. Y.  
Kilbourne & Jacobs Mfg. Co., Columbus, Lansing Wheelbarrow Co., Lansing, Mich.  
Syracuse Chilled Plow Co., Syracuse, N. Y.  
Variety Machine Co., Warsaw, N. Y.
- Tab Hoops**  
Oatman Bros., Medina, Ohio.
- Tab Expanders**  
Henderer, A. L. Sons, Wilmington, Del.
- Tubes, Seamless Drawn Copper, Brass and Bronze**  
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.  
Randolph-Crowe Co., Waterbury, Conn.
- Tabing, Brass**  
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.  
Ivins, Ellwood, 487 Broadway, N. Y.  
Phoenix Tube Co., Brooklyn, N. Y.  
Spofford, W. S. & Son, Providence, R. I.
- Tabing, Iron**  
Phoenix Tube Co., Brooklyn, N. Y.
- Tabing, Seamless**  
Ivins, Ellwood, 487 Broadway, N. Y.
- Tabing, Steel**  
Harris, Sam'l & Co., Chicago, Ill.  
Best Transmission Co., Danbury, Ct.  
Ivins, Ellwood, 487 Broadway, N. Y.  
Janney, Steinmetts & Co., Phila., Pa.  
Lang's John S. Son & Co., 4 Fletcher St., McKees, C. B. & Co., Phila., Pa.  
National Tube Co., Pittsburgh, Pa.  
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Tumbling Barrels**  
Henderson Bros., Waterbury, Conn.  
Northern Engineering Works, Detroit, Mich.
- Turnbuckles**  
Cleveland City Forge & Iron Co., Cleveland, O.  
Merrill Bros., 465 Kent Ave., B'klyn.
- Twist Drills**  
Cleveland Twist Drill Co., Cleveland, Morse Twist Drill & Machine Co., New Bedford, Mass.  
New Process Twist Drill Co., Taunton, Mass.  
Slocumb, J. T. & Co., Providence, R. I.  
Standard Tool Co., Cleveland, O.
- Twist Drill Grinders**  
Heald, L. S. & Son, Barre, Mass.  
Washburn Shops of Worcester Polytechnic Inst., Worcester, Mass.  
Wilmarth & Morgan, Grand Rapids.
- Union Couplings**  
Dart, E. M. Mfg. Co., Providence, R. I.
- Unions, Brass**  
Nolte Brass Co., Springfield, Ohio.
- Upholsterers' Hardware**  
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.
- Valves, Gas, Water and Steam**  
Ashton Valve Co., Boston, Mass.  
Chapman Valve Mfg. Co., Boston.  
Crosby Steam Gate & Valve Co., Boston.  
Jenkins Bros., 71 John, N. Y.  
Kennedy Valve Mfg. Co., 75 John St., N. Y.  
Lunkenheimer Co., Cincinnati, Ohio.  
McNab & Harlin Mfg. Co., 56 John, N. Y.  
Mason Regulator Co., Boston, Mass.  
Wood, H. D. & Co., Philadelphia, Pa.
- Varnish**  
Standard Varnish Works, 29 Broadway, N. Y.
- Vegetable Slicers**  
Streeter, N. R. & Co., Rochester, N. Y.
- Ventilating Fans**  
American Blower Co., Detroit, Mich.  
Bayley, Wm. & Sons Co., Milwaukee, Wis.  
Boston Blower Co., Hyde Park, Mass.  
Buffalo Forge Co., Buffalo, N. Y.  
Exeter Machine Wks., Boston, Mass.  
Perkins, B. F. & Son, Holyoke, Mass.
- Ventilating System**  
Ormsby, C. A., Melrose, Mass.
- Ventilator Appliances**  
Howard & Morse, 45 Fulton St., N. Y.
- Ventilators**  
Drouve G. Co., Bridgeport, Conn.  
Merchant & Co., Inc., Philadelphia, Pa.  
National Pancoast Ventilator Co., Phila., Pa.
- Ventilator Openers**  
Ormsby, E. A., Melrose, Mass.
- Vertical Milling Machines**  
Ingersoll Milling Machine Co., Rockford, Ill.
- Vices**  
Athol Machine Co., Athol, Mass.  
Bignall & Keeler Mfg. Co., Edwardsville, Ill.  
Hollan's Mfg. Co., Erie, Pa.  
Howard Iron Works, Buffalo, N. Y.  
Lewis Tool Co., 44 Barclay St., N. Y.  
Massey Vice Co., Chicago, Ill.  
Parker, Chas. Co., Meriden, Conn.  
Prentiss Vice Co., 44 Barclay St., N. Y.  
Utica Drop Forge & Tool Co., Utica, N. Y.
- Wagon Jacks**  
Covett Mfg. Co., West Troy, N. Y.  
Covett's Saddlery Works, Farmer, N. Y.  
Lane Bros. Co., Poughkeepsie, N. Y.  
Morrow, P. C., Newport, Pa.
- Washers**  
Hal's, Sam'l Sons, 229 West 10th St., N. Y.  
Haskell, Wm. H. Mfg. Co., Pawtucket, R. I.  
Nut & Washer Mfg. Co., Milwaukee, Wis.  
Wilson & Smith, Worcester, Mass.
- Washers, Lead**  
Littleford Bros., Cincinnati, O.  
Milton Mfg. Co., Milton, Pa.
- Washing Machines**  
Brammer, H. F. Mfg. Co., Davenport, Ia.  
Bucke & Churn Co., Sidney, O.  
Clark, Quaten & Morse, Peoria, Ill.  
Richmond Cedar Works, Richmond, Va.  
Wayne, Anthony Mfg. Co., Ft. Wayne, Ind.
- Watchman's Clocks**  
Nanz, C. & Co., 127 Duane St., N. Y.  
Waggoner Watchman Clock Co., Grand Rapids, Mich.
- Water Gates**  
Kennedy Valve Mfg. Co., 75 John St., N. Y.
- Water Wheels**  
Poole, Robt. & Son Co., Baltimore, Md.
- Well Supplies**  
Cook, A. H., Lawrenceburg, Ind.
- Wheelbarrows**  
American Steel Scraper Co., Sidney, O.  
Kilbourne & Jacobs Mfg. Co., Columbus, Lansing Wheelbarrow Co., Lansing, Mich.  
Syracuse Chilled Plow Co., Syracuse, N. Y.
- Wheels, Steel**  
Havana Metal Wheel Co., Havana, Ill.
- Wind Mills**  
Flint & Walling Co., Kendallville, Ind.
- Window Cord**  
Samson Cordage Works, Boston, Mass.
- Window Fasteners**  
Stanley Works, New Britain, Conn.
- Window Weights**  
Barney & Reed Mfg. Co., Boston, Mass.
- Wire**  
Dillon-Griswold Wire Co., Sterling, Ill.  
Grand Crossing Tack Co., Grand Crossing, Ill.  
Kidd Bros. & Hargner Steel Wire Co., McKees Rocks, Pa.  
Miller & Van Winkle, Brooklyn, N. Y.  
National Wire Co., New Haven, Ct.  
New Haven Wire Mfg. Co., New Haven, Conn.  
Prentiss, Geo. W. & Co., Holyoke, Mass.  
Reading Screw Co., Norristown, Pa.  
Sawyer Wire Co., Worcester, Mass.  
Stewart Wire Co., Easton, Pa.  
Summit Wire Co., Cuyahoga Falls, O.  
Townsend, C. C. & E. P., New Brighton, Trenton Iron Co., Trenton, N. J.  
Wolf, R. H. & Co., Ltd., 118th St. and Harlem River, N. Y.  
Wright & Colton Wire Cloth Co., Worcester, Mass.
- Wire Chains**  
Bridgeport Chain Co., Bridgeport, Ct.  
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.  
Oneida Community, Ltd., Niagara Falls, N. Y.
- Wire Cloth**  
Barnum, E. T., Detroit, Mich.  
Clinton Wire Cloth Co., Clinton, Mass.  
Derby, Edward & Sons, Philadelphia.  
Estey Wire Works Co., 65 Fulton St., New York.  
Gilbert & Bennett Mfg. Co., 42 Cliff St., New York.  
Howard & Morse, 45 Fulton St., N. Y.  
Hungerford, U. T., Brass & Copper Co., 121 Worth St., New York.  
Ludlow Saylor Wire Co., St. Louis, Mo.  
Michigan Wire Cloth Co., Detroit, Mich.  
New Freedom Wire Cloth Co., New Freedom, Pa.  
N. J. Wire Cloth Co., Trenton, N. J.  
Scheeler's Sons, Buffalo, N. Y.  
Tyler, W. S. Co., Cleveland, O.  
Wickwire Bros., Cortlandt, N. Y.  
Wright & Colton Wire Cloth Co., Worcester, Mass.
- Wire Cutters**  
Chandler & Farguhar, Boston, Mass.  
King, J. M. & Co., Worcester, N. Y.  
Utica Drop Forge & Tool Co., Utica, N. Y.
- Wire Dies**  
McFarland, Wm., Trenton, N. J.
- Wire Drawing Machinery**  
Morgan Construction Co., Worcester.  
Mossberg & Granville Mfg. Co., Providence, R. I.
- Wire Fences—(See Fencing, Iron and Wire.)**
- Wire Goods**  
Brooks, M. S. & Sons, Chester, Conn.  
Darby, Edward & Sons, Philadelphia.  
Gilbert & Bennett Mfg. Co., 42 Cliff St., New York.  
Jenckes, E. Mfg. Co., Pawtucket, R. I.  
Michigan Wire Cloth Co., Detroit, Mich.  
Scheeler's Sons, Buffalo, N. Y.  
Wickwire Bros., Cortlandt, N. Y.  
Wire Goods Co., Worcester, Mass.
- Wire Forming Machinery**  
Automatic Machine Co., Bridgeport, Ct.  
Manville, E. J. Mch. Co., Waterbury, Ct.  
Nilsson, A. H. Mch. Co., Bridgeport, Ct.  
Snuster, F. B. Co., New Haven, Conn.
- Wire Mill Machinery**  
Braddock Mch. & Mfg. Co., Braddock, Pa.  
Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.
- Wire Mats**  
Hartman Mfg. Co., 309 Broadway, N. Y.  
U. S. Wire Mat Co., Decatur, Ill.
- Wire Nails**  
American Screw Co., Providence, R. I.  
Dillon-Griswold Wire Co., Sterling, Ill.  
Grand Crossing Tack Co., Grand Crossing, Ill.  
National Wire Co., New Haven, Ct.  
Summit Wire Co., Cuyahoga Falls, O.  
Townsend, C. C. & E. P., New Brighton.
- Wire Nail Machinery**  
Braddock Mch. & Mfg. Co., Braddock, Pa.  
Miller, H. J., Bridgewater, Mass.  
National Machinery Co., Tiffin, Ohio.  
Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.
- Wire Poles**  
Jenkinson, R. C. & Co., Newark, N. J.
- Wire Reels, Adjustable**  
Shuster, F. B. Co., New Haven, Conn.
- Wire Rods, Steel**  
Ashland Steel Co., Ashland, Ky.  
Consolidated Iron & Steel Co., Bristol, Pa.  
National Wire Co., New Haven, Conn.  
Nicoll, S. & Co., 59-61 Wall St., N. Y.  
Prentiss, Geo. W. & Co., Holyoke, Mass.  
Spencer Wire Co., Worcester, Mass.  
Wolf, R. H. & Co., Ltd., 118th Street and Harlem River, N. Y.
- Wire Rope, Iron and Steel**  
American Steel & Wire Co., Chicago, Ill.  
Broderick & Bascom Rope Co., St. Louis.  
California Wire Works, San Francisco.  
Hazard Mfg. Co., Wilkesbarre, Pa.  
A. Loesch & Sons Rope Co., St. Louis.  
Macomber & Whyte Rope Co., Chicago, Ill.  
Trenton Iron Co., Trenton, N. J.  
Wat-rbury Rope Co., 60 South St., N. Y.  
Williamsport Wire Rope Co., Williamsport, Pa.
- Wire Straightening and Cutting Machinery**  
Shuster, F. B. Co., New Haven, Conn.
- Wire Stretchers**  
Arcade Mfg. Co., Freeport, Ill.
- Wood Hardware**  
Bliss, R. Mfg. Co., Pawtucket, R. I.
- Wood Screw Machinery**  
Cook, Asa S. & Co., Hartford, Conn.  
Fox Machine Co., Grand Rapids, Mich.
- Wood Working Machinery**  
Dehance Mch. Works, Dehance, O.  
Pay, J. A. & Egan Co., Cincinnati, O.  
Seneca Falls Mfg. Co., Seneca Falls, N. Y.
- Woodenware**  
Richmond Cedar Works, Richmond, Va.
- Wrenches**  
Atlas Pipe Wrench Co., 121 Liberty St., N. Y.  
Reiden Machine Co., New Haven, Conn.  
Bemis & Call Hdw. & Tool Co., Springfield, Mass.  
Chicago House Wrecking Co., Chicago, Ill.  
Coss Wrench Co., Worcester, Mass.  
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